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TRAVELS
FROM
FRANCE TO ITALY,
THROUGH
THE LEPONTINE ALPS;
OR,
AN ITINERARY OF THE ROAD FROM LYONS TO TURIN,
BY THE
WAY OF THE PAYS-DE-VAUD, THE VALLAIS,
AND ACROSS
THE MONTS GREAT ST. BERNARD, SIMPLON,
AND ST. GOTHARD:
WITH
TOPOGRAPHICAL AND HISTORICAL DESCRIPTIONS
OF THE
PRINCIPAL PLACES WHICH LIE CONTIGUOUS TO THE ROUTE;
INCLUDING
SOME PHILOSOPHICAL OBSERVATIONS
ON
THE NATURAL HISTORY AND ELEVATION OF THAT PART OF THE ALPS.
TO WHICH ARE ADDED,
REMARKS ON THE COURSE OF THE RHONE,
FROM ITS SOURCE TO THE MEDITERRANEAN SEA.

BY ALBANIS BEAUMONT,
AUTHOR OF THE RHETIAN AND MARITIME ALPS,
&c. &c. &c.

VIDI EGO QUOD FUERAT QUONDAM SOLIDISSIMA TELLUS
ESSE FRETUM; VIDI FACTAS EX ÆQUORE TERRAS:
ET PROCU A PELAGO CONCHÆ JACUERE MARINÆ;
ET VETUS INVENTA EST IN MONTIBUS ANCHORA SUMMIS:
QUODQUE FUT CAMPUS, VALLEM DECURSUS AQUARUM
FECIT; ET ELUVIE MONS EST DEDUCTUS IN ÆQUOR.

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1800.

GRAVELS

FRANCE TO ITALY

THE LEPONTINE ALPS

BY JAMES H. ON THE ROAD FROM LUGANO TO TURIN

AND OF THE PAYS DE VAUD, THE VALAIS

THE MOUNTAINS GREAT ST. BERNARD, ST. NICHOLAS
AND ST. GOTHARD



THE NATURAL HISTORY AND MINERALOGY OF THAT PART OF THE ALPS

DETAILED OF THE COURSE OF THE RHONE

IN THE MOUNTAINS OF THE ALPS

BY ALBERT DE CROIX

WITH A MAP OF THE MOUNTAINS OF THE ALPS

THE MOUNTAINS OF THE ALPS

THE MOUNTAINS OF THE ALPS

THE MOUNTAINS OF THE ALPS

THE MOUNTAINS OF THE ALPS

THE MOUNTAINS OF THE ALPS

THE MOUNTAINS OF THE ALPS

ADVERTISEMENT.

ENCOURAGEMENT stimulates to perseverance. It has had this effect on the author of the following work, who has been induced, by the flattering reception which the British Public have given to his former volumes, to present to it the sequel of his Alpine observations, and the remaining views which he took in his excursions in these wonderful districts of Nature.

Not long after his arrival in England with his Royal Highness the DUKE of GLOUCESTER, whom, at the command of his Majesty the KING of SARDINIA, he accompanied in his tour through Switzerland, Italy, &c. leaving the situation which, in the capacity of hydraulic engineer, he occupied at Nice, he published his Travels through the Rhætian Alps: to these he has since added, "Travels through the Maritime Alps, across the Col-de-Tende, from Italy to Lyons, &c. including Select Views in the South of France."

The Work he now ventures to offer to the elegant and enlightened part of the British nation, for he is conscious that it is not suited to every pocket and every reader, may be considered as a continuation of the latter publication, and a link connecting it with the former; so that the three works taken together, if they do not form a complete TABLEAU DES ALPES, yet exhibit an account of several extensive ranges or chains of mountains, extending from the Mediterranean Sea to Germany.

With an earnest desire of instructing and entertaining, he has his fears of presuming too much on the public approbation of his former labours, and therefore does not send this work into the world, especially at the present time, with full confidence in its success.

Philosophy is not now, alas! in the highest estimation; and the noise of war, and the hurricanes of political contention, have made the great, in general, inattentive to the sweet and mild invitations which Nature is continually giving to man to study her works.

Perhaps he may not improperly address his book in the words of Martial:

I, FUGE; SED POTERAS TUTIOR ESSE DOMI.

Lib. I. Epig. 4.

ADVERTISEMENT.

Previous to entering on the contents of the present publication, which is intended to give an accurate description, with a relative and geographical situation, of the route which leads from Lyons to Italy, through the Comté de Bresse, Pays-de-Vaud, the Vallais, extending also across the Monts St. Bernard, Simplon, and St. Gothard, the author thinks it may not be improper to observe, that as the passages across those mountains, which are some of the most elevated peaks of the Alps, have of late been more frequented than formerly, owing, in a great measure, to the cruel and afflicting war which has unfortunately involved all Europe, and placed, as it were, by its ravages, insurmountable barriers to most of the other passages which lead to Italy, he flatters himself that such a narrative as he has prepared, accompanied by his pencil, will not fail of being acceptable to those who have already made the same route, and may probably excite in others a desire of exploring this region of the Alps.

Diffident, however, of his abilities, the Public will surely not condemn him for having, in order to enrich and strengthen his observations, now and then been led to avail himself of the hints of those eminent naturalists, who still continue to merit and obtain the approbation of scientific men in general, as Messrs. de Saussure, De Luc, Pictet, and others.

This Itinerary will not only have the advantage of serving as a continuation to the Maritime Alps, but as a supplement or finish to a work published ten years ago by the same author, before he came into England, entitled "*Voyage Pittoresque aux Alpes Pennines*," and translated in this country, in 1794, without his knowledge. *Vide the Monthly Review for May, 1794, page 183.*

That publication, or rather abridgement, gave but a short and concise description of the route from Geneva to the glaciers of Faucigni in Savoy, including the left bank of the Lake Lemán, or Lake of Geneva; whereas, this is intended to take in the opposite side of the same lake, tracing the course of the Rhône and the whole of the glaciers north-east of Mont Blanc; so that these two works may be said to comprehend a complete, and, it is hoped, accurate collection of observations and views of the most interesting objects, from Lyons to the city of Aösta in Piedmont, not excluding the great and majestic glaciers which cover the basis of Mont Blanc, to the fertile hills of the Pays-de-Vaud.

The above explanation may probably be found perfectly useless by those who have read the author's *Maritime Alps*, &c.; but to persons who have not, it was thought proper to account for the abrupt manner in which the following description begins.

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FRANCHE COMTEE







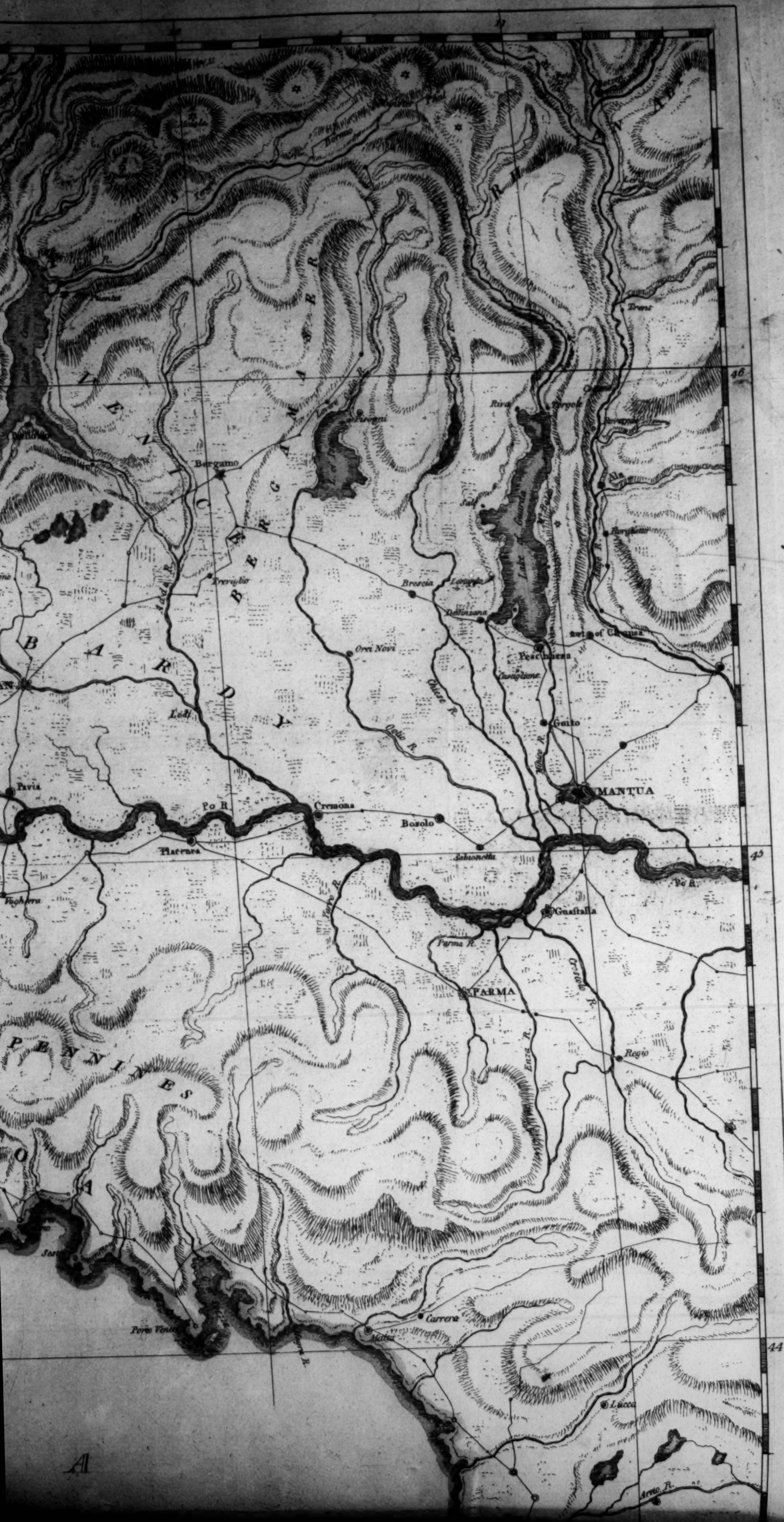
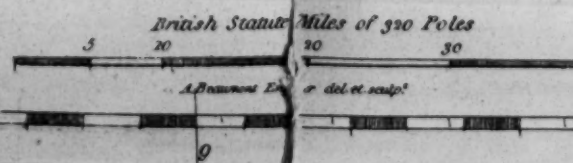








CHART
of places connected with
the Route from
LYONS in FRANCE to TURIN & LOMBARDY
Including likewise
the principal Peaks of that Chain of the Alps
from
the BUCHETTA to MONT ST. GOTTHARD
in the
LEPONTINE ALPS.





with
& LOMBARDY
ise
n of the Alps
ST. GOTHARD
PS.

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Nº 2.



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LYONS.

I was at Vienne in Dauphiny when I projected the excursion which is the subject of the following pages; and with an earnest desire of attentively exploring a celebrated portion of the *Aërie Alpes*, I set out, as soon as I had prepared matters for my journey, towards Lyons, where the valley of the Rhône gradually widens, and the secondary mountains of the Alps and Vivarès, which screen it on both sides, diverge in an equal proportion, and leave the course of that beautiful river to be traced by a succession of fertile and well-cultivated hills, each seeming to surpass the other in vegetation.

This superb amphitheatre is covered alternately by meadows and vineyards, where the luxuriant branches hang negligently from the trees, which consist chiefly of apple, plum, cherry, &c.; through which a variety of elegant villas, and neatly-looking cottages, peeping between their variegated tufts, serve, when combined with the pellucid waters of the Rhône, and the various mæanderings or windings of its course, greatly to enrich the prospect, and render the scene highly picturesque.

The situation, therefore, of Lyons, in the middle of such a fertile country, and at the confluence of the two rivers, the Rhône and the Saone, must surely be, in many respects, a truly enviable spot, and such as is peculiarly adapted to the establishment of an inland commercial town: for those two great rivers, after having separately watered, and by their sediments manured and fertilised, the different provinces through which they flow, unite at the southern extremity of the city, as if to encourage and stimulate by that union the industry and activity of the inhabitants, and serve as a channel for the easy and extensive conveyance of the several articles of that astonishing trade which for years characterised that beautiful city.

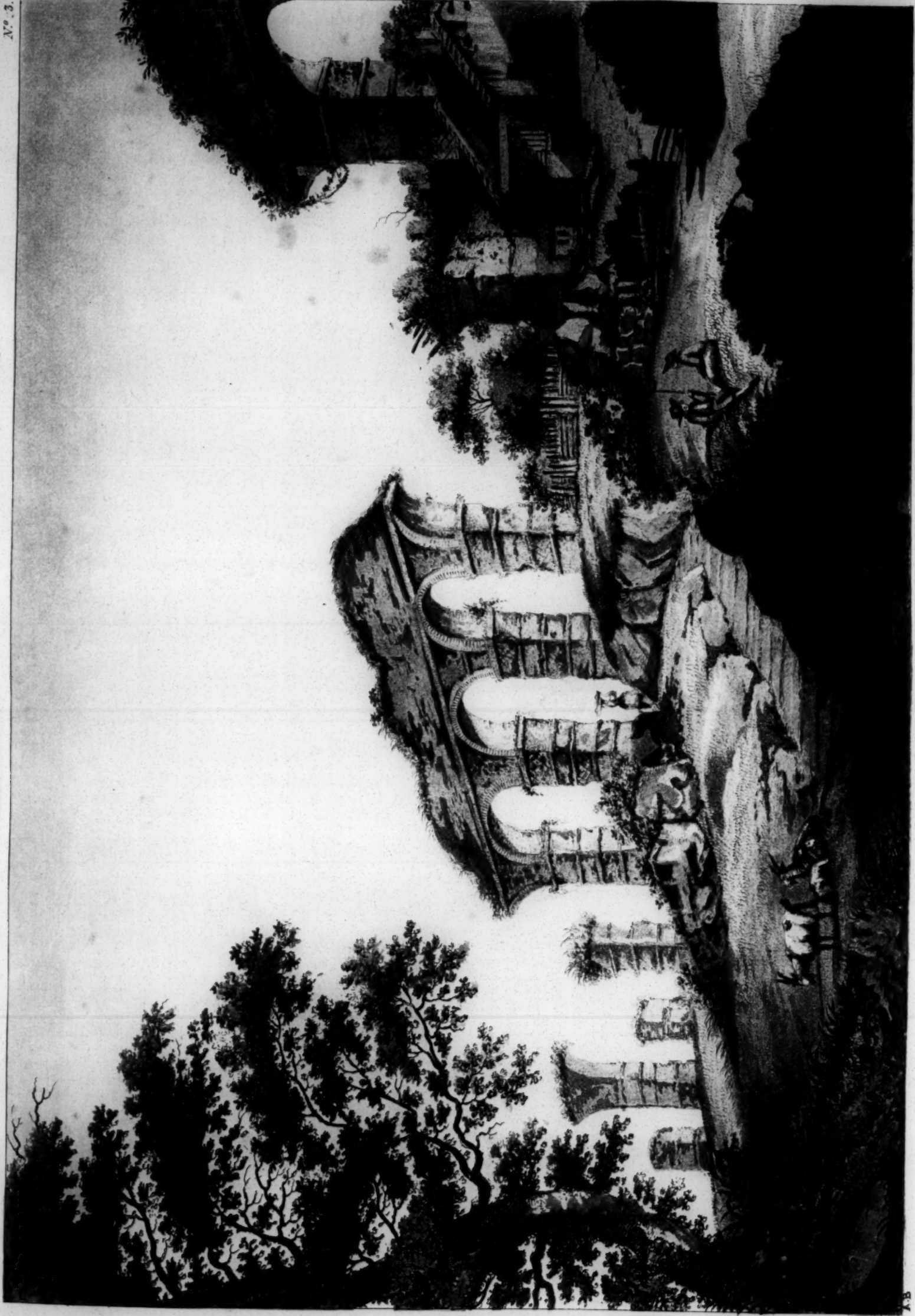
Lyons, or *Lugdunum Segusianorum*, or *Cellarum*, is one of the most ancient towns in France, and was, after *Paris*, the most magnificent, prior to the revolution. It appears to have existed long before the conquest of Gaul by the Romans, as the capital of an extensive kingdom, of which the Saone and the Rhône were the limits, and which formed that kind of *delta* described by Polybius, chap. 10, as being the place where Hannibal

met the two brothers contending for the kingdom of the Allobroges; who, having granted succours or assistance to the eldest, Brancus (according to Livy), obtained the object he had in view, to facilitate his passage into Italy across the Alps.

In the time of the Romans it is supposed to have formed one of the principal cities of *Gallia Celtica*, or *Lugdunensis prima*. The emperor Augustus, and afterwards Nero, are said to have contributed greatly towards its aggrandisement and embellishment. It is even asserted, that Augustus made it for a short time his place of residence. And, according to some authors, it boasts of having been the native city of Marcus Aurelius, and of Claudius Nero, son to Drusus. Suetonius, the historian, in his life of Caligula, speaks of the gymnasium, or academy, at Lyons, for the discussion of Greek and Latin subjects, on the same plan of that formerly at Athens: and the abbé Expelli, in his Dictionary of the Gauls, says, that the monastery of Aney, now known by the name of *Monasterium Athenense*, is built on the spot where that academy once stood.

There are few cities in France which have experienced, at distant epochas, such calamities as Lyons, having not only suffered by revolutions in various shapes, but been ravaged at different periods by the successive inroads of barbarous hordes, who, after the decline of the Roman empire, made frequent incursions into Gaul; so that few vestiges remain of its ancient magnificence; although sufficient to convey to a contemplative mind serious reflexions on the sad vicissitudes and reverses to which human affairs are liable. These vestiges chiefly consist in the scattered remains of a Roman palace, theatre, public baths, &c.; the greatest part of which are still buried or concealed in the rubbish or loose fragments of the mountains of *Gonevière*. It is therefore no improbable idea, that the ancient city of Lyons, or *Lugdunum*, which derives its appellation from *Lucii dunum*, or mount of *Lucius*, *dunum* being Celtic for a mountain, originally stood on the declivity of the mountain; a conjecture which appears still more forcibly confirmed by the extensive subterraneous passages which have of late been discovered on the eastern side of it; part of which I visited in 1787.

On the summit of the same eminence stand the superb remains of an aqueduct. This beautiful Roman work is supported by a tier of arches, some of which exceed fifty feet in height; and, from what now remains of this curious work, it seems to have extended upwards of ten miles in length. Its construction merits the attention of every man of observation, being mostly built of small pebbles, incrustated with a strong cement.



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The ancient city appears to have remained in the possession of the Romans till about the year 472 of our æra; when the emperor Anthemius, desirous of the assistance of the Burgundians, a people who at that time inhabited Savoy, against the Visigoths, who were making incursions, and laying waste that part of *Gallia Narbonensis*, promised them the city of Lyons as a reward for their services.

Soon after its cession, it became the metropolis of the new kingdom of Burgundy: a government which however proved but of short duration; for the Franks and Ostrogoths uniting, about one hundred and twenty years after its foundation, against Gondemar, the last sovereign of that country, he was dethroned; and, in consequence of a division of his states taking place, Lyons, in 534, fell under the dominion of the Franks, in whose possession it remained till 870; at which time it passed into the hands of Conrad, king of the second kingdom of Arles and Burgundy.

In 1173 it underwent another considerable change; for the whole of the Lyonese territory being ceded by Guy the Second, count du Forest, to his brother Guichard, bishop of that province, it then became governed by its own bishops, who from that period were honoured with the title of princes, and chosen by the chapter, composed of canons, who, previous to their ordination, were obliged to prove their right to the ancient noblesse of the country, and were then dignified by the appellation of count. But, in 1314, the then reigning prince and prelate granted to Louis Hutin of France, with consent of the chapter, the temporal jurisdiction of that province; reserving to himself only what related to the spiritual state of the country, for which the court of France conferred on him the dignity of archbishop and primate of Gaul.

Previously, however, to the revolution of 1789, the public administration of Lyons was in a great measure entrusted to a *prévot des marchands*, or president, commonly taken from the class of merchants; and four syndics, elected by the people. But those important offices degenerating soon after their institution into mere empty titles, both the legislative and executive power devolved into the hands of a governor-general, a receiver-general of the province, a senechal, presidial, &c.; who judged and decided in the name of the king. So that in fact, at the revolution, the Lyonese found themselves bereft of most of their ancient privileges, except the exclusive one of guarding their city by enrolling or appointing their militia, with an exemption from billeting or lodging troops; in which respects Lyons might be compared to the city of London, which enjoys that municipal and exclusive privilege.

This once great commercial town was considered as the capital of a province of the same name, which extended about forty-two miles from north to south, and twenty-four from east to west, lying in lat. $45^{\circ} 50'$, long. $4^{\circ} 55'$, east of Greenwich. Neither, however, is its climate so hot as might be expected from its latitude, nor is its atmosphere so dry as in many parts of the south of France; two circumstances which may, I think, be accounted for from its locality, which is in a valley at the confluence of several rivers or torrents, and seated at the foot of a range of hills, whereby the air is rendered cold and humid; and also from the thick fogs to which the place is peculiarly subject in the autumn, arising from the extensive swamps which border both sides of the Rhône, at some distance from the eastern part of the city.

Those fogs, added to the strong sulphureous smell emitted from the quantity of coal consumed in the manufactures, and shops, even of the meanest artificer, with the busy and active appearance of the mercantile part of the inhabitants, gave it another striking resemblance to London.

The soil of the whole country is extremely rich and productive, both in corn and pasturage. The people breed vast quantities of cattle; their vines, which are prolific, partly cover the hills that border the banks of the Rhône, and yield a most excellent wine. In fine, the different productions of the whole province have been computed to be nearly sufficient for the consumption of its own numerous inhabitants.

The population of Lyons, as I was well informed, before the revolution, exceeded one hundred and eighty-six thousand souls. But, alas! how widely different even at that period were the reports on its commerce, once so flourishing and prosperous—it being then, comparatively speaking, nearly annihilated. This town between forty and fifty years ago might be said to carry on a more extensive trade than any city in France, or in most parts of Europe; it being well known, that the Lyonese exported, from their own manufactures, gold and silver stuffs, silks in vast quantities, ribbands, laces, printed calicoes, hats, hemp, flax, and various other articles, to every corner of the world. But nothing surprised me more, when I was last at Lyons, than the freedom with which the mercantile people in general spoke of the measures of government, delivering their opinions without the least restraint, attributing to these the annihilation of their commerce: for many of them, whom I had the curiosity to consult on that subject, acknowledged, that it might be clearly demonstrated that their trade had from

the above period been gradually on the decline ; and that, in 1787, commerce was at so low an ebb, that the people formerly employed in the manufactures were reduced to the most extreme indigence.

The origin of this decline they partly attributed to the repeal of the edict of Nantes, and partly to the persecution sustained by the Protestants at different periods, during the reign of Lewis the Fifteenth, which compelled many unfortunate families to emigrate, and to seek among strangers that protection and encouragement which was so impolitically denied them in their own country. Thus forced from their native soil, they established, where they had taken refuge, a variety of manufactures, which, in a short time, not only equalled those of France, but in some respects surpassed them.

Bitter invectives were frequent in the mouths of the Lyonese against the court and noblesse of France, for having at once, as it were, adopted the fashions and customs of the English, and thereby not only encouraged, but sanctioned by their example, the class of bourgeois in following that Anglomania as they called it ; a class which is unfortunately every-where too prone to imitate their superiors, both in manners and principles, even to the destruction of their dearest and most obvious interests.

Hence their manufactures, being degraded in the eyes of their countrymen, ceased in a great measure to be called for ; and the poor artificer, thrown out of employment, fell a victim to the inconsiderate fastidiousness of the great and opulent. Thus, dejected and discouraged, a numerous and active class of people imperceptibly lost that taste, energy, and emulation, for which they were once distinguished.

The merchants and manufacturers of Lyons, in consequence of this change, finding it no longer practicable to copy English merchandises, and sell them at the reduced prices expected by their correspondents, were themselves forced to import goods from England, which not only accelerated their ruin, but involved the other principal commercial cities of France in the same calamity.

The American war, unfortunately happening at this critical period, unfolded mysteries to the French people, which, at that epoch, they little thought to have seen so soon explained ; for, in consequence of the very active part taken by their government in the cause of liberty, that same government was soon after forced to oppress and lay additional burdens on those who could so ill support them, and who already groaned under despotic power ; so that the fire of disaffection, which had been for some time kindling, soon blazed forth, and rapidly increased : a certain proof that the American

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war was the last bitter drop which made the cup of affliction to overflow ; for, from secret murmurs, the people soon passed on to open remonstrances, and personal invectives, against the agents of oppression.

But, alas! of all the evils which infest a state, idleness, the concomitant of vice and profligacy, co-operated most forcibly to inspire in the bosom of a people, whose passions were inflamed as their activity was suppressed, cruel and bitter reflexions on their wretched situation, which were in reality but too well founded ; so that, immediately after the conclusion of the peace with America, the nation at large, tired of restraint and humiliation, waiting only for a favourable opportunity of shaking off their shackles, and chiefs to lead them on, felt themselves, as it were, instantaneously electrified by the sparks of liberty imported by their companions, and eagerly enlisted under the banners of freedom, in the hopes of reaping its blessings.

How greatly it is to be lamented, that, instead of having realised that prospect of happiness they so ardently desired, and indeed expected, by the change which has been operated in their government, they should, for such a length of time, have met nothing but a succession of calamities, falling alternately innocent victims to the cruel and rapacious, who, elated by false ambition and the private pique of a few individuals, have, like a rapid torrent, precipitated that unfortunate nation into an abyss of horror, too dreadful to dwell on, and over which I wish to draw a veil, in order to conceal deeds which ought to be obliterated from the memory of man !—deeds which must for ever tarnish the page of history !

I leave to others the unpleasant task of recapitulating the afflictive scenes and cruel events which have accompanied what at first appeared a glorious revolution,—it not being for me to determine whether it may be either necessary or politic to inform posterity of all the horrors with which it has been disgraced, though we cannot overlook the great moral causes which have doubtless accelerated it.

Being fully persuaded that the degeneracy and vices of nations proceed most commonly from a defect or abuse in their form of government, I shall conclude by using the language of *Belisarius*, who, in his observations on governments in general, says, that “ Political society can neither exist nor maintain itself without a great share of virtue and morality in the members which compose it : that a depravity of morals ; an effrontery in the pursuit of vice and profligacy ; a contempt for virtue, and, of course, for those who respect it ; unfair dealings in trade ; perjury, perfidy, sordid selfish

interest, instead of love for the general or public good ; are the sure and certain forerunners of the fall of states, and overthrow of empires : for, as soon as the ideas of good and evil are blended together, there can no longer exist either blame, praise, reward, or punishment."

And, assuredly, we cannot feel any hesitation in admitting the Roman general's assertion : for universal history confirms the fact, that nations rise, fall, and revive, by the operation of those very causes which he enumerates ; that they flourish or sink into decay and misery in proportion as public virtue is encouraged or suppressed.—Make a people emulous of virtue, and they will rise ; but if they foster vice, they cherish what must destroy them.

CONTINUATION OF LYONS.

DEPARTURE FROM THAT CITY.

THOUGH the plan of the present work does not require me to enter into a regular and minute detail of the various objects meriting notice, to be found in the cities, towns, and villages, included within the line of my projected route, yet I cannot prevail on myself entirely to pass over those things which persons who travel for information ought to explore. With the philosophic observations contained in this tour I wish to blend something of a lighter kind. Perhaps, after this explanation and apology, I may be allowed to proceed to a general description of Lyons—a city which cannot be surveyed without exciting admiration, and which travelers have repeatedly praised.

Its quays and wharfs in particular must arrest attention; for as the major part of the city is built between the Saone and the Rhône (rivers which are both navigable for miles previous to their junction), these public works, for beauty, execution, and high preservation, not only equal, but surpass, I may venture to assert, most of the kind in Europe. It is likewise impossible for me to speak too highly of those constructed on the Rhône, deemed *chefs-d'œuvres* in their line, and as much admired for the perfection of their workmanship (which being of free-stone, gives them a noble and cleanly appearance) as for their regularity and extent, most of them being one hundred feet in width, and the whole extending from four to five miles in length, including the works on the Perrache*.

* A part of the city which stands at the extremity of the Delta, noticed by Polybius, which takes its name from an individual, who, about thirty years ago, undertook to build a new town on what had till then been only a swampy unwholesome tract of land; a plan which would doubtless have succeeded, and done infinite honor to its ingenious promoter (several of the houses being already completed in 1780), had not the trade of that great commercial city been soon after totally annihilated by the unfortunate causes before stated, which occasioned, for a time, the buildings to be delayed, and at last entirely suspended. The mills situated on the same spot, contiguous to the junction of the Saone and the Rhône, are likewise worth seeing, on account of their curious construction.

These quays are almost every where in a straight line, and the greatest part of those situated on the new bed of the Rhône are shaded by an avenue of trees on each side of the terre-plein, which serves as a delightful promenade for the inhabitants. The stones with which these quays are built, were brought from Savoy, a distance not less than forty miles; a circumstance which must have made them works of great labour and expense.

The various bridges which are thrown across the Rhône and the Saone have a good effect; the wooden ones in particular are worth notice, from their singular construction, and boldness of execution. The one which leads to the village of Broteaux, on the left bank of the Rhône, is particularly so. The stone bridge, *La Guillotière*, although of ancient date, is still handsome, and makes a noble appearance. It consists of twenty arches; and, instead of being built in a straight line over the river, describes a kind of curve, which, like that of St. Esprit, forms a convexity to oppose the current, and doubtless for a similar reason, the bend being certainly better calculated to resist the force of the Rhône, which is here excessively rapid. In the centre of the same bridge stands a square tower, the gates of which are shut every night at the same hour. This tower originally served as the limit betwixt the Dauphiné and Lyonesse provinces.

Among the public edifices which adorn this great city, are the hospitals and *maisons de charité*: they are of vast extent, and display much elegance of external symmetry. The *Hotel Dieu* in particular, which is built on the quay contiguous to the Rhône, presents to the eye a complete piece of architecture, the pediment and cupola being of a most excellent taste.

I cannot here pass over in silence the sentiment which affected me at the time, and which I think must naturally be felt by every philanthropist, when he sees objects, which, from their outward splendor, are too often apt to give us an exalted idea of the grandeur and pleasure of life; but when viewed in a different light, and we are led, by a long train of inscriptions and emblematical devices, to regard them as pompous and beautiful outsides, including the sufferings of human nature, or serving as an asylum for the wretched and infirm, oh, what a sudden depression does the mind feel! Are we not then disposed to condemn such ill-placed pageantry, and to lament that, in most countries, they are not, as in England, more adapted throughout to the principle of their institution? For myself, they commonly give me the idea of a well-dressed man of fashion asking charity. And again, how greatly is it to be feared that, in attending

too much to the external elegance of such establishments, their internal comforts and conveniences, are often neglected!—mankind being in general too prone to sacrifice the plain dictates of virtuous simplicity to a false show of ostentatious pomp and parade.

The squares in Lyons are numerous, and most of them handsome. In the centre of the *Place Belle-cour* or *Royale*, which is not only one of the largest in the city, but deemed the most magnificent in France, stood a beautiful equestrian figure *, in bronze, of Lewis the Fourteenth. The statues which represent the Rhône and the Saone, with trophies analogous to the subject which decorate its pedestal, were of excellent proportion, and finely executed. The *Place des Terreaux*, although not so extensive, is by no means inferior in point of beauty to that of *Belle-cour*, being in fact more uniform and regular.

The *Maison de Ville*, which is one of the most superb buildings of the kind in Europe, contributes not a little to its magnificence, as it occupies one whole side of the square. There are besides these several others, but of less consequence, as *la Bourse*, where the mercantile people assemble, *St. Jean*, *Comfort*, &c.

This noble city, which must, as before observed, furnish so much real satisfaction to every traveler of taste, cannot however boast of being formidable in point of strength, its fortifications consisting only of a few bastions or orillons, constructed on the side of *La Croix rousse*, a part of the town so called; and even these are in a most wretched state. Yet has Lyons three forts, although in as ruinous a condition as the bastions, and which, previous to the revolution, were used as state prisons. They might, however, in case of emergency be easily repaired, and employed with advantage for the defence of the city. That of *Pierre Seize*, or *Pierre en Seize*, is the most considerable, and stands at the entrance of Lyons, towards the high road to Paris, on the continuation of the mountain *de Fourvière*.

From its extreme height and excellent situation, it commands not only that part of the Saone which flows contiguous to the city, but the long and extensive suburbs of *Vaise*, and the hills on the opposite side of the river, where stands the famous monastery of the *Chartreux*, so noted for the excellence of its paintings, which are much admired. The other forts, or rather bastilles, are *St. Jean*, and *Ste. Claire*.

The arsenal is an extensive handsome building, well supplied with every species of martial weapons, and situated on the banks of the Saone: but what does infinite honour to the inhabitants of this city, are their public libraries, many of which have been

* Taken down at the commencement of the Revolution.

established at the expense of private individuals. The Bibliothèque Publique is in particular well stored with a numerous and valuable collection of books, curious manuscripts, various astronomical and philosophical instruments, and is opened twice a week. As for the others, free access to them is allowed every day, as well as to several cabinets of natural history, filled with medals, fossils, and fragments of antiques, besides other curiosities—a proof not only that the Lyonese know how to cherish and value a true taste for the sciences, but that they are equally desirous of having that taste encouraged and propagated; and happy am I to add, that the late disturbances have not affected those literary institutions.

They have likewise an academy of arts, sciences, and belles lettres; a society or board of agriculture; and, previous to the revolution, a seminary for the children of reduced French nobility; besides a famous veterinarian school, and two theatres.

Having, in the former description of this city, stated my opinion as to what were the fatal effects produced on the Lyonese, and the rest of the French people, by the fall of their manufactures, and total annihilation of their commerce; as also by the want of morals and decency in most of their administrators, I shall here subjoin some few observations on the character and manners of the Lyonese, that I may omit nothing necessary to explain the principal and chief causes which have accelerated the mighty and astonishing event which has just passed, as it were, under our eyes, in that populous and fertile nation; an event which, though tarnished by a series of extraordinary cruelties, the recollection of which will for ages draw almost tears of blood from every virtuous philanthropist, must unfortunately appear to the eye of the philosopher nothing more than the natural, though horrid, consequence of human nature, whenever wisdom and virtue are supplanted by passion and vice; for nothing can be more certain than that every age carries in its breast, as it were, the seeds of the one which is to follow. The age of virtue and of law naturally prepares the way for valour and glory: this last produces conquests and luxury, which as certainly brings in all the train of effeminate vices, and at last terminates in the destruction of states.

The Lyonese are remarkable for great hospitality, and an extreme sweetness of temper. They are deemed neither so fickle as the Parisians, nor so lively as the Provençals; possessing firmness and perseverance in a much higher degree. They may likewise be accounted amateurs of the arts; for they cultivate them with ardour and often with success.

Their passions being less quick or irritable than those of the other inhabitants of the South of France, their firmness appears to border on obstinacy, which leads them to persevere in whatever they undertake, till they have gained their point, provided there be the least probability of success.

The females are in general handsome, lively, gentle in their manners, and remarkably well informed. The bourgeois are some of the prettiest women I have seen, of their condition. Their dress is elegant, and their amusements simple. An excursion a few miles from the city, in order to enjoy a pleasant walk, a delightful prospect, or any kind of rural or innocent festivity, has considerably more charms for them than a box at the opera.

The love of reading extending to all classes, the females have indiscriminately a strong propensity to be romantic; and, as a proof of this assertion, I am induced to relate an incident that happened the first time I visited Lyons, the authenticity of which I can, I think, answer for, as I not only saw one of the principal females concerned in the fatal catastrophe, but received the whole narrative from a person who was intimately acquainted with the parties. The time which I refer to may be about five-and-twenty years ago, when family affairs called me to Lyons; and, as I had never been there before, I provided myself, as is customary on such occasions, with a letter of recommendation to one of the principal mercantile houses, wishing to be properly introduced, and at the same time enabled, in some degree, to see and judge of the real genius of the people; the study of human nature having from an early age continually interested my mind.

The excellent and worthy man to whom I was recommended received me with all the frankness, hospitality, and genuine politeness, which in general characterises, throughout the French nation, persons of that class.

No sooner had he discovered my intention than he instantly offered me his assistance, the better to pursue and facilitate my success. By way of showing his sincerity and desire of obliging, he oftentimes accompanied me himself to the different manufactures, mills, public buildings, and, in short, to every part of Lyons and its environs, that he supposed ought to be examined by a person of my inquisitive turn of mind. At other times, when business prevented his personal attendance, one of his clerks, a genteel young man, who possessed not only a good understanding, but a most communicative temper, became my companion.

In one of these perambulations, we were led to the humble habitation of an honest weaver, a poor but industrious man, one of those whom they employed by the week, and with whom my conductor had some business to transact: for, previous to the annihilation of the commerce of that city, it was astonishing how many worthy indigent families were thus maintained; the greatest part of the manufacturers being under the necessity of employing looms from home, in addition to those continually kept at work in their own houses.

When arrived at this good man's dwelling, we ascended a fifth story (the houses at Lyons being to the full as high as at Paris), and entered a tolerable sized room, which served as workshop, lodging, and, in fact, for every purpose to a family consisting of a father, mother, and four children, who had nothing but their daily labour to depend on. While my companion conversed with the father, a venerable old man, I accosted the son, a youth of eighteen, who was weaving gauze at one end of the apartment. After some trifling introduction, I appeared desirous of being made acquainted with the mechanical part of his business; at the same time requesting him to inform me what he might be capable of earning per week. To these interrogatories he answered with great ingenuousness and civility; but on my appearing astonished at seeing three looms unemployed, he, with a most significant shrug of the shoulder, accompanied by such an intelligent but melancholy look, that I could have wished to have retracted every syllable I had uttered, said, "*Est-ce-que monsieur ne sait pas que le commerce ne va plus en France? Car, tant que les cotillons seront à la tête du gouvernement, il n'y aura pas grand'chose à espérer pour nous, excepté l'hôpital, ou le métier de soldat, à cinq sols par jour; et cette dernière ressource, monsieur, ne peut guères faire bouillir la marmite pour six personnes.—Mais enfin, n'importe; il faut maintenant prendre patience, car cela ne peut pas durer*.*"

This discourse I afterwards found held not only partially by the artificers and mechanics at Lyons, but universally reverberated throughout the nation; a prelude which assuredly announced but too strongly the fatal crisis which was approaching, and which was certainly accelerated by the ruin of the manufacturing community.

* Are you not acquainted, Sir, that trade no longer flourishes in France; and that, whilst we are under petticoat government (alluding to Madame Du Barry), there is little to be expected for us, except the refuge of an hospital, or the profession of a soldier, at five sols per day? Which last resource is but a scanty pittance towards making the pot boil for half a dozen individuals.—Yet, no matter, we must have patience; this cannot last.

During this short conversation, perceiving a delicate and interesting figure, with a lovely but dejected countenance, embroidering at a tambour, I could not refrain from asking some questions concerning her; adding, that they were surely to blame in allowing her to work in so reduced and weak a state as she appeared to be. To this he answered, in a half whisper, that she might not hear him, "Hélas! monsieur, c'est ma bonne sœur. Nous craignons que rien ne puisse la soulager, et qu'elle ne pourra survivre au chagrin qui la consume; car depuis la mort de son amie, elle va toujours de pire en pire. Nous la plaignons beaucoup, car c'est la meilleure enfant du monde*."

My companion, suspecting the subject of our conversation, from perceiving JUSTINE, which was the young woman's name, instantly quit her seat (on finding that she had attracted my attention) and join her mother at the further end of the room, immediately came up to us, requesting me in a low voice to desist, for the present, from any more inquiries, but leave him to relate a tale that would swell my heart with sorrow. As for the poor girl, the recollection of scenes which filled her mind with horror, had doubtless pierced her very soul, for she was unable to restrain her tears. Scarcely had we taken our leave, and reached the bottom of the stairs, than I earnestly entreated him to fulfil his promise. To this he readily agreed, and began a narrative to which my pen is unable to do justice; yet will I endeavour to relate it literally as I had it from his own mouth.

"JUSTINE," proceeded he, "whose extreme delicacy, and dejected melancholy appearance, has attracted your attention and affected your sensibility, was born of poor but industrious parents, enriched only with virtuous simplicity. It appeared however that fortune in some degree had smiled on her birth, since, in consequence of her mother being taken to suckle a neighbour's child, whose parents were in affluent circumstances, she became foster-sister to the young ROSINA.

"These infants being, as it were, brought up together from the cradle, formed at the earliest period of their lives a permanent affection for each other; and to such lengths did Rosina carry her partiality, that, when the time of separation arrived, her generous and noble mind seemed insensible to every kind of amusement.

* Alas! Sir, she is my dear sister. We fear that nothing can relieve her, and even think that she will be unable to survive the sorrow which consumes her; for, ever since the loss of a dear and affectionate friend, she has become worse and worse. We grieve much for her, for she is one of the best young women in the world.

" Her mother, who loved her with extreme tenderness (having lost her husband soon after the birth of her child), distressed at seeing her miserable, and desirous of anticipating every wish that could give her happiness, immediately gained her neighbour's consent to take their daughter entirely under her protection; saying, that she should not only reside with hers, but that she meant herself to superintend their education, and they should both be her children; that of course they ought not to have any further anxiety concerning their child's future welfare, but rejoice at seeing her so happily and so amply provided for. Elated at the proposal, these honest parents the more readily consented, as, being in straitened circumstances, and finding their work decreasing daily, they were scarcely able to maintain their family. Thus did Justine, at five years of age, quit the parental roof, to reside with her young friend.

" Rosina's mother being in an extensive mercantile line at Lyons, by no means deemed it a proper situation for the young folks; but giving them to the care of a well-informed female, and an old trusty domestic, she sent them to her country residence, a most beautiful spot at about three miles distance; where, free from the unavoidable bustle and confusion of a large city, she determined on having them educated, reserving to herself the pleasing satisfaction of visiting them frequently, in order to witness the progress they made in their education.

" In this delightful spot did these amiable young friends pass their time in innocent retirement and rational amusements, improving their minds, and enriching their understandings daily, by every species of elegant accomplishments.

" With what pleasing emotions did Rosina's mother perceive, that as their judgement and ideas imperceptibly expanded, the tie of friendship became still stronger, and their solicitude for each other increased in the same proportion! Seldom were they tempted to go to Lyons, except when attracted by the desire of seeing their parents, who could not always so conveniently visit them: so that these young folks might be said to have glided through the greatest part of their youth exempted from those fatal trials which are but too often the cause of our misfortunes: and surely the innocent and virtuous simplicity which reigned in their hearts, and had hitherto guided every action of their lives, seemed to insure them a continuance of tranquil and undisturbed serenity. But, alas! how concealed and inexplicable are the ways of Heaven! Who can discern those fine and slender threads that often compose the web of our fate?

"The lovely and interesting Rosina, in the bloom of youth and beauty (having just entered her eighteenth year), added to an elegant form and pleasing manners a great share of sensibility, and a soul fraught with extreme tenderness, which had too unfortunately been enervated by the reading of novels; and though she had hitherto at times experienced only a slight and transient symptom of that baneful and fatal languor, the forerunner of strong and dangerous passions, yet was she on the brink of feeling its most direful effects.

"This charming girl having, in one of her excursions to Lyons, seen an Italian youth, a few years older than herself, who had been introduced at her mother's, and whose name, to the best of my recollection, was *SERVIETTI*,—struck with his noble and manly appearance, and a countenance which bespoke wit and sensibility, the too-susceptible Rosina found it impossible to regard the young stranger with a look of indifference.

"This partiality, on further acquaintance, daily increased; and finding that he not only realised the favourable opinion she had already formed, and possessed a general knowledge of the arts she most admired, but was beloved and countenanced by the first families in Lyons, it is surely not to be wondered that she did not sufficiently guard her unsuspecting heart against the alluring voice of love; a passion which soon after became reciprocal. For the youth, who had frequent opportunities of conversing with this amiable young woman, no longer able to witness such intrinsic merit without feeling similar emotions of partiality, soon formed an attachment, which, to all appearance, might have insured their future happiness, had not Rosina, from a dread of displeasing her mother (who, she suspected, might be averse to their union), concealed the fatal flame which preyed on her vitals, and which finally induced this unfortunate pair to hurl themselves together into eternity:—an act which the heart pities, while the judgement condemns.

"I cannot follow these unfortunate lovers in the various events which preceded that fatal moment; suffice it to say, that Rosina's visits to her mother became more frequent; till, finding that the country, and its innocent amusements, had lost their wonted charms, and that *ennui* and disgust succeeded, she requested her mother to allow her to remove to Lyons; a request which was immediately complied with by the unsuspecting parent, who, seeing her darling and only child gradually declining, flattered herself that a change of scene might be of service.

"The young friends; therefore, quitted their delightful abode, much to Justine's regret; who, with reluctant steps, accompanied Rosina; being fully persuaded that, from her determined secrecy, the happiness she was then pursuing would be but of short duration.

"This amiable young woman, who loved her friend with the sincerest attachment, and who from the first had known her partiality for Serviotti, no sooner saw her with her mother, than she again renewed, by every persuasive and consolatory argument, her entreaties that she would unfold the secret to her tender parent; but finding her still averse, she for a time desisted.

"Then, by a thousand kind and affectionate attentions, did this generous girl endeavour to close the wound, and pour the balm of comfort into the heart of her infatuated friend; hoping that, by degrees, she might be led to succeed in restoring to her mind a faint resemblance of the happy, tranquil state, they had once enjoyed:—but in vain. Rosina, rather than believe her friend, cherished the cruel flame; and, instead of seeking the advice of a tender mother, which she stood so much in need of, encouraged the consuming flame in silence, and pined in endless hope.

"Justine, on finding that neither tears nor entreaties availed, determined on trying her last resource; and, though a cruel and trying task, she candidly confessed, that, if she still persisted in her silence, she should unavoidably break through every tie of friendship, and prefer relinquishing what she held most dear, rather than become ungrateful to her benefactress. Thus, compelled to sacrifice the confidence of friendship to the sentiments of gratitude, she instantly repaired to Rosina's mother, and not only apprised her of her daughter's deplorable situation and partiality for Serviotti, assuring her that she had used every persuasive argument to prevail on her to disclose the fatal secret, but added, that this confidence was not to be disregarded, for that she knew the attachment preyed on Rosina's mind, and might, in the sequel, prove fatal.

"The deluded parent, resting confidently on her daughter's virtue and innocence, paid scarcely any attention to Justine's report; yet, lest she might appear totally to disbelieve it, sent her daughter to Avignon, on a visit to some relatives, where she made a considerable stay:—an absence, which would doubtless have proved effectual, had not the mother's ill-timed affection, who could but ill dispense with the cruel, and, as she thought, unnecessary separation, hastened Rosina's return; for, in consequence of having imparted to Justine the desire she had of fetching her home, they both

instantly set off for Avignon, and brought back her daughter, apparently restored to health and spirits. No sooner had she regained her wonted confidence in her friend, than she seemed anxious to return to that delightful abode, where they had previously experienced happiness and content.

“ The fond and credulous parent, pleased at the request, hastened their departure ; far from suspecting that, the moment she acquiesced, her fate would be decided. For, in allowing her to return to solitude, she not only signed her own death-warrant, but that of her beloved child. Ere two months had elapsed since the young friends had quitted Lyons, as they were sitting together at supper, talking over the many interesting scenes they had witnessed from their infancy, and dwelling particularly on the early and lasting friendship they had formed for each other, Rosina suddenly changed colour ; and, complaining of indisposition, entreated Justine to excuse her retiring earlier than usual ; but not to be alarmed, as she should soon be better.

“ The unsuspecting friend, from the idea that she had entirely conquered her attachment for Serviotti, not having heard her mention him since her return, made no farther inquiry, but remained, till alarmed about an hour after, when all was silent, and every one, as she thought, retired to rest, save herself, by the report of two pistols, which appeared to issue from a part of the house contiguous to their chapel. Petrified with horror, and filled with a thousand apprehensions, she endeavoured to recollect herself, and directed her tottering steps towards Rosina’s apartment,—when, behold ! the aged and venerable domestic, previously mentioned, met her before she had been able to reach it, and with broken and unintelligible accents, intermixed with tears of sorrow, which trickled down his furrowed cheeks, unfolded such a tale as harrowed up her soul ! ‘ His dear young mistress ; his child, as he was wont to call her ’ (being in the family at the time of her birth) ; ‘ his dear young mistress,’ he said, ‘ was no more !—that infamous, that detestable Serviotti, had murdered her in the chapel ; and, not deeming that a sufficient crime, had added the one of murdering himself.’

“ Paint to your mind, if you can, the deplorable and agonising situation of this generous and amiable young woman ;—for, ere the tale had been half told, she had fainted ; and a long time elapsed before she could be restored to her recollection.

“ On inquiry, it appeared that the lovers had had frequent interviews with each other since Rosina’s return, though unknown to her friend ; that she had even that very day fixed on the hour for the completion of a deed at which humanity shudders.

"To such lengths had these unfortunate victims carried their infatuation, that, in order to fall at one and the same moment, the pistols had been tied to the back of a chair, in the form of a *sautoir*, or cross. A prayer-book was found by them, opened at the funeral-service; and close to Rosina a bible, in which lay a paper, soliciting forgiveness from God and her mother, for the rash and atrocious act she was on the eve of committing; requesting her parent, in the tenderest terms, to continue her affection for her friend, who was, indeed, more deserving the appellation of daughter than herself; for, unable to exist without Serviotti, she had flown to the cold arms of death, to ease her of her sufferings.

"Thus, alas! perished, in the prime of life and beauty, these amiable but ill-fated lovers, who would, doubtless, have been ornaments to society, had not a false idea of virtue led them not only to commit suicide, but occasion the death of a fond and tender parent, who, distracted at the loss of her child, survived her a few days only, and was buried in the same grave.

"The unfortunate Justine, the last surviving victim of this mournful tale, finding herself bereft of every comfort, and thrown into a state of penury by the mercenary and cruel hands of wretches who had till now viewed her with envy and dissatisfaction, and who, elated at seeing no provision made for this helpless girl, forced her to return beneath the humble parental roof, where, with all the fortitude and resignation possible, she endeavours to sustain her irreparable loss."

I must add, that I saw enough in her countenance to convince me how unsuccessful would be all attempts at consolation. Worn out and depressed by grief and anguish, the exertion which she made to earn her daily sustenance was more than her weak frame could bear; and I have since heard that she did not long survive the death of her friend.

This incident having passed, as it were, nearly under my eyes, I thought I could not omit mentioning it, on account of its singularity, and the better to show the manners and character of the Lyonesse, as well as the danger produced by reading books which have, in general, so pernicious a tendency to the innocent and unsuspecting.

I may probably be found remiss, by those who are endowed with extreme sensibility, for not having entered more at large into the particulars of this melancholy story, and expatiated on the accumulated misery of the unhappy individuals concerned: but, leaving it to others to work it up by pathetic touches, I have contented myself with

barely relating, without embellishment, the simple and affecting narrative, such as I heard it, and return to descriptions less agitating.

The surrounding country is beautifully fertile, abounding in rich and romantic scenery; the prospects and sites every where presenting a happy mixture of mountain, wood, and water.

So delightfully picturesque are the environs of this magnificent city, that, in point of beauty, they assuredly yield not, in the smallest degree, to the many curious and interesting objects contained within its walls, although of a different species.

Never shall I forget the noble and extensive prospect I enjoyed from the summit of the mountain de Fourvière; it being one of those spots, in the proximity of the Alps, where, from its superior elevation, that formidable chain of mountains, with their cragged sides and spiry tops, which terminate the horizon on the eastern side of the city, in an extent of more than two hundred and fifty miles, presents itself in the highest style of grandeur. With what mixture of wonder and admiration, as the great luminary of heaven was sinking to the nether hemisphere, did I view the tremendous peaks of that immense chain, whose tops are covered with eternal ice!

The appearance they exhibited was in itself so awfully surprising, that it is impossible for me to form an idea of any thing more beautiful.

The hills and plains were already plunged into the shade of night by imperceptible gradations; whilst the mild and beneficent beams of the setting sun still tinged the elevated peaks, which, in the back-ground, appeared like planets emerging from beneath the horizon, forming a most pleasing contrast with the purple hue of the secondary mountains.

How often, while my eyes have been fixed on such noble and majestic scenes, have I experienced sentiments similar to those expressed by Rousseau's poor woman; who, on viewing the wonderful beauties of Nature, confined her devotion to the Supreme Author of our existence, to that emphatical but expressive ejaculation—"O!"—which though short and concise, might be seen to proceed from a heart swollen with gratitude and admiration.

The better to enjoy the superb sight above described, as well as to have a bird's-eye view of the city of Lyons and the adjacent country, I would recommend the traveler to ascend the steeple of *Notre Dame de Fourvière*, a church which stands on the summit of the same mountain, which, according to M. de Luc, is four hundred and

forty-three feet more elevated than the Rhône, and nine hundred and forty-seven above the Mediterranean sea.

Not far from thence, and within the inclosure of the garden *des Pères Minimes*, remain the fragments of the Roman theatre noticed in the preceding description, a sketch of which is given in plate XII. fig. 1. The greatest part of its circuit is still extant.

Beyond the same convent, and near the gates St. Irenée, stands the noble aqueduct already mentioned, which is supposed to have extended ten miles. N° 2 exhibits a part of those magnificent ruins, taken about a mile and a half from the town St. Irenée.

The famous monastery of the Chartreux is built on the summit of a mountain directly opposite to de Fourvière, which tends rather more to the east, and serves as a kind of separation between the Rhône and the Saone.

From this elevation the prospect is nearly as extensive as from the former; for the eye not only wanders over the rich and fertile plains of Dauphiny and La Bresse, but likewise takes in the greatest part of the course of those beautiful rivers.

In descending the same mountain, almost contiguous to La Croix Rousse, stand the vestiges of a Roman Naumachia, deserving notice; the whole of its external circuit, which is oval, being entire.

I think I may venture to assert, that amateurs in painting and architecture may be as amply gratified in visiting the noble edifices which exist in such profusion both within and without the city, as the naturalist and botanist by exploring its environs. But as I do not mean to enlarge on this subject at present, I shall merely add, that the formation or structure of the mountains de Fourvière and Chartreux are worthy of attention.

These mountains, which are in general calcareous, exhibit, in many places, enormous pieces of granite, which appear as if emerging from beneath their strata; whereas, in other parts, such pieces of granitic stone lie scattered on their northern sides, resembling, in that respect, the long chain of hills near Turin, described in the author's "Maritime Alps," page 15.

I have likewise remarked, on the continuation of the mountain de Fourvière (the side towards *St. Etienne en Forêt*), that its calcareous strata incline considerably under hills of schisti, of which the laminæ are nearly vertical, containing a quantity of curious impressions of plants and marine substances. And again, in a hollow or cross-road





leading from La Brêle to Lyons, at the distance of about four miles, the strata of grey (or kind of sand-stone), which are in many parts abruptly filled with different sorts of shells, confusedly mixed together, viz. tellimites, municites, pinnites, and other fragments of similar fossils.

These strata appear to be of a coarse grain, mostly soft, so as to crumble with ease, and incline to a greyish blue. The botanist may likewise find, in these environs, a profusion of plants with which to decorate his herbal, and for which I refer him to the *Hortus Lugdunensis* of Boerhaave.

Quitting, at last, this charming city, where, during my last visit, a short time before the revolution, I had staid six weeks, in my way to Geneva, I directed my course towards the Pennine Alps, leaving the bridge La Guillotière, which leads to Savoy, on my right, and passed through the gate of Ste. Claire, at the extremity of the Quay of the Rhone *. But as the distance from Lyons to Geneva is not less than ninety miles, mostly across a mountainous country, which makes it difficult to accomplish in one day, and as speed would have defeated the purpose of my tour, I determined on stopping at Nantua, a small town in the province of Bugey.

* Vide Plan of Lyons, N° 4.



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DESCRIPTION

OF

THE ROAD FROM LYONS TO NANTUA.

ON quitting the city of Lyons, through the Fauxbourg Ste. Claire, the banks of the Rhône gradually retreat; the high road taking a north-eastern direction, leaving that noble and extensive river more towards the east.

Proceeding on my journey, I crossed La Bresse, or *Brixie Comitatus*, a province in part bounded by the rivers Saone and Rhône; which, previous to the treaty of Lyons in 1601, between Henry the Fourth of France and Charles Emanuel the First, duke of Savoy, made part of that sovereign's dominions: but, ever since that period, it has been annexed to the French territory.

My route, therefore, lying through this country (which may be pronounced one of the richest provinces in France, being no less fertile and pleasing than the delightful environs I had just left), I stopped at Mirebel, the first village I came to, about nine miles from Lyons.

This village, or rather town of no considerable extent, possesses, if I may judge from the cheerfulness of the inhabitants, and the cleanly comfortable appearance of the town altogether, more ease and affluence than is in general met with in most of the French provinces: a sight which augmented my pleasure; as every object around harmonised with the rich and fertile state of the country, and added considerably to the charms of the landscape.

From hence I directed my course to Mont-luel, or *Mons-lupelli*, the capital of the Pays de Valbonne, although included in the province of La Bresse. This town, which is seven miles from Mirebel, is agreeably situated at the extremity of an extensive well-cultivated plain, and nearly at the foot of a long range of hills, which are in great part covered with vines, pasturage, and wood. Those hills, or more properly this hill from its appearing but as one, though it extends some miles, is formed of a kind of

coarse-grained sand-stone, the particles of which, in many places, crumble, having very little coherence, resembling the *arenarius flavescens* of Wallerius, spec. 77.

I likewise discovered, on the same chain, a small species of *echinites* and *gryphites*, in excellent preservation, besides fragments of other marine fossils, which must have been hurried thither by some great convulsions of nature, such as our globe has doubtless experienced at different epochas; and, as a fresh proof that the sea did once cover that part of our continent, those fossils, in their interior, contain argillaceous matter, totally different from that in which I found them. They are likewise heaped in irregular groupes or clusters; and many of them fixed in a hard calcareous incrustation, of a yellowish colour.

In taking the elevation of Mont-luel, the last-mentioned town, I found it to be six hundred and fifty-eight feet above the level of the sea, and one hundred and twenty above the Rhône, in the vicinity of Lyons.

From Mont-luel, having forded the river Lain, or Dain, which takes its source from among the stupendous mountains of Franche Comté, and though, in general, inconsiderable, becomes tremendous on the melting of the snow, I proceeded towards St. Denis, a village five miles further.

The country, thus far, presents an immense plain, which loses itself in the horizon at its northern extremity; yet, the numerous towns, villages, and hamlets, irregularly scattered over this rich and extensive surface, not only diversify the view, and destroy the idea of monotony which a wild tract of plain frequently conveys, but embellish the scene, and prove, to a certainty, the industry of the inhabitants. Besides, most of the farm-houses and cottages, though constructed of clay, make such a cleanly and decent appearance that penury seems totally discarded from their humble dwellings.

The manner of building, on inquiry, appeared so simple, while the effect was so pleasing, that I cannot withhold the information I gained, on this subject, from one of the honest peasants, who was in the act of making some addition to his little cottage. After showing me the manner in which the clay was prepared, by beating it with a mallet (made on purpose) for a length of time, he added—"That a quantity of pebbles, taken from the adjacent rivulets, were then mixed with it, which, from his description, formed a kind of amalgam not unlike pudding-stone, and then thrown into wooden *encaissemens* or cases, placed where the walls of the house were to be erected; that those cases being only six feet in length, three in height, and one and a half in

width, they were under the necessity of removing them as the building extended—which, when finished, gave it the appearance of free-stone; that they again beat or mixed the clay when put into the cases, in order to bring it to a consistency, and to accelerate its drying; that likewise, prior to the walls being quite dry, it was customary to lay on two or three coatings of quick lime and plaster, with a few handfuls of salt mixed together; but, if they were desirous of giving a yellowish or greyish hue to the outside, a small quantity of ochre, or burnt straw, reduced to powder, and mixed with water, was then added:—a simple manner of painting *al fresco*, which not only serves as an admirable deception, but delights the eye.

The peasantry of this province, being mostly proprietors, each possessing a small piece of land, which they can call their own, these *chaumières* are numerous, and are profusely scattered on this wide surface, which extends for miles, sometimes on the edge of a forest, at other times on the side of a meadow, or at the foot of a rivulet; whilst the green turf, variegated with aromatic flowers, and the bright tints of aquatic herbs, diversify the scene, and give the whole plain an appearance on which the eye delights to repose.

I did not remark that the soil, though rich and well manured, had that tenacity which is observed in marly land, or *terres franches*; for, in many places through which I passed, I often noticed only an ox and a horse, and sometimes a cow and an ass, yoked to the plough instead of horses.

The mutton is excellent, and much esteemed for flavour and taste; and their sheep are reckoned the finest in France, next to those of the province of Berry, for the beauty of their wool. This superiority of excellence with regard to their sheep is supposed to be, in great measure, owing to the rich pasturage on which they feed, and which is peculiar to this province.

The farmers, in general, confine their flocks in folds, in order to improve their land; and they successively remove them, from place to place, till the fall of snow; at which time they feed them in part with poplar leaves, dried for that purpose.

But as the wolves from the adjacent mountains, pushed on by hunger, frequently descend into the plains, a shepherd regularly attends with dogs, having a hut so constructed as to run on wheels, which he draws after him when the fold is changed.

From the village of St. Denis I pursued my route six miles farther, to that of St. Jean le Vieux, where the hills which had before begun merely to show themselves, increase

so rapidly, that from hence to Cerdon, another village at about the same distance, they might be classed as mountains of the second order. Indeed, so sudden and unexpected did this rise appear, the first time I visited that part of France, that I was led to suppose them to be a ramification of the mountains of Jura, in Switzerland, which stretch towards the French frontier; but in consequence of having, some time after, explored them with attention, I was soon convinced that they were totally foreign to those, both as to structure and direction: these, with very little variation, tending from north to south; whereas the others extend from north-east to south-west. And though some of these hills are calcareous, containing even fossils similar to those found in the Jura, yet the inclination, thickness, and colour of their strata, are so widely different, that I was perfectly satisfied there was no apparent connexion between them, but that they formed two separate chains.

By way of strengthening or elucidating this assertion still farther, I soon after made an excursion on purpose to explore them; and observed, at about a mile and a half south-west of the public road, at the back of a castle which stands on the summit of a mountain some distance from Cerdon, that the basis of many of the hills belonging to the same range appeared to be of granite, if we judge by the immense pieces which projected from their sides; whereas others are entirely of a hard calcareous stone, containing no impressions whatever of shells or fossils.

These granites, of which there are likewise several huge pieces scattered on the surface of many of them, are so soft, that they seem to dissolve or crumble of themselves, being very like what I found near Auxerre in Burgundy.

May we not therefore be inclined to believe that the major part of this chain owes its origin to a more distant epocha than that which formed the mountains of the Jura, and that the other part is of a posterior date; or, in other words, that its structure may have been effected at the time of the great *débâcle*, or *bouleversement*, which formed the lake of Geneva. But, as I shall have occasion to enlarge hereafter on this idea, I shall only now remark, that, in the wide and deep cavities naturally formed between the pieces of compound stone, which, to all appearance, serve as the basis of many of the hills, I discovered a number of shells and fossils, most of them incrustated with a calcareous matter similar to that which covers the *Dôle*, the highest point of the Jura.

The romantic little village of Cerdon, from whence the rise of the hills is so conspicuous, stands in a bottom, at the foot of the above chain; yet the high road, which

passes through it, imperceptibly discovers to the traveler, as he journeys on across a most picturesque country, a rich and pleasing variety of landscape, presenting, at intervals, tremendous objects of rude Nature.

Conceive a formidable mountain, now and then rising in a perpendicular direction, sometimes appearing as though shelving over the road, ready to detach pieces from its craggy sides; at other times, a stupendous rock, presenting itself unexpectedly to view, as if to bar the passage, leaving no apparent alternative but that of scrambling over its abrupt and jagged surface; and now an impetuous torrent, sweeping down the steep its foaming waters, dashing them precipitately from rock to rock, seeming to dispute the pass, and to put a stop to all further progress, while it fills the mind with a mixture of awe and terror.

But how quick the transition to other sensations! for Nature soon resumes her milder features, and displays an aspect of placid beauty; the road continuing through the centre of a charming tranquil vale, and across fertile fields and rich meadows, shaded by trees, between whose thick foliage the eye catches, at intervals, a distant peep at the humble cots I had so much admired, and whose rustic roofs and mildly-tinted walls blend admirably with the surrounding scenery.

The pass across this range of hills, which I take to be the first step towards the Alps, cannot fail of producing a strong impression on the mind of every admirer of rude Nature, or of such features as she is wont to assume in these tremendous mountains,—scenes calculated for contemplation, and to awaken thoughtfulness in persons of common as well as of the most exalted intellect. And this reflexion has frequently led me to grieve, that so many of those, whose fortunes enable them to travel, should be so vitiated by the luxury and dissipation of great cities as scarcely to have a wish to peep out of their carriages to behold mere natural beauties.

It may here be necessary to observe, that, although the village of Cerdon apparently lies in a hollow, yet, on my taking its elevation, I found it to be nine hundred and sixty-six feet above the level of the sea, and four hundred and twenty-two higher than the Rhône in the vicinity of Lyons. The summit, likewise, of the mountain that commands this village, by which the high road to Geneva passes, opposite to the excavation made in the main rock in order to widen the road, appeared, by my measurement, five hundred and sixty feet above Cerdon (which is reckoned twelve miles from Nantua), and one thousand five hundred and twenty-six above the level of the sea.

The country from hence is extremely irregular; but the road is good, and the descent of the above mountain by no means so steep as on the side towards Lyons. This deception is in fact so great, that travelers, who have never before passed this route, naturally expect to find, from having for miles so rapidly ascended, a proportionate descent on the opposite side: on the contrary, the road continues nearly on a level the whole way to Nantua; or, at least, the declivity does not exceed eighty-six feet for the space of twelve miles; for the town of Nantua stands one thousand four hundred and forty feet above the level of the sea, and the summit of the mountain one thousand five hundred and twenty-six,—a difference which can appear singular only to those who have not previously visited the Alps, or who do not reflect, that though the hills of Cerdon are at one hundred miles distance, at least, from the summit of that grand primordial chain, it is nevertheless certain that they may be esteemed, as I have before stated, the first steps towards it. Though I am still clearly of opinion, as when speaking of the different widths of the basis of that extensive chain (*vide* "Maritime Alps," page 41), that they do not extend to so considerable a distance from their summit on its eastern side as on its western.

The nearer I got to Nantua, the more conspicuous was the gradual rise of the mountains which skirted the road, and terminated my horizon on the east. On a closer investigation, their strata, which were infinitely more distinct than any I had met with since my departure from Lyons, appeared to incline towards the north; which inclination became still more visible in the neighbourhood of St. Martin, a village three miles on this side Nantua; for the abrupt mountain on my left exhibited so great an inclination in the strata, that they literally seemed to extend or lengthen under the lake of Nantua.

This lake, which takes its name from the town, is only five miles in circumference, but is well stocked with fish, and of vast depth of water, which is in general the case with all lakes in or contiguous to the Alps. The mountains which surround this lake are calcareous, but do not all equally contain fossils, there being several in which there are not any; and there are very few in those which screen its southern extremity.

I continued, from the village of St. Martin, along the delightful banks of the lake, on a kind of causeway, serving to check or bar the sudden rise of the water at the melting of the snow. This rise is then so rapid and considerable, that inundations

would doubtless be frequent in various parts of the country, and would lay the adjacent towns and villages under water, were it not for two or three bridges, which have been very effectually constructed, and, I may add, most judiciously so, by the person who superintended those works; and the water, at present, is seldom known to rise above two feet at its greatest swell. The arches, acting as a kind of drain, direct its course towards some swampy lands or fens, situated at the western side of the bank, into which it throws itself with violence, and thus, by overflowing them entirely, forms another lake of about three miles in circumference.

Having, for another mile, followed the banks of the lake of Nantua, I took an easterly direction, and reached the foot of a very romantic cascade, which falls from the summit of a mountain that screens the lake at its northern extremity.

This water-fall is very singular; for, instead of precipitating its water rapidly from the top of the mountain, it filtrates, and comes out from between its strata, at about two thirds of its elevation, and with a noise so considerable, as to be heard on the opposite side of the lake.

Doubting whether the water really proceeded from between the strata, I had the curiosity, in my second excursion to Nantua, to scramble to the top of the mountain which commands the fall, in order to ascertain the fact, and find out its source. There I soon convinced myself that the water proceeded from a small lake, which I could easily distinguish, and which, though five hundred feet above that of Nantua, appeared to lie in a hollow; so that its water, having no other way of draining off than by this kind of filtration, naturally produced the above-mentioned effect, which is well worthy of the traveler's attention, and may lead to the explanation of similar phenomena in the arrangements of Nature.

The road here again becomes very rural and picturesque, sometimes leading along the windings of the lake, whose tranquil surface and pellucid water form a most pleasing object, contrasted with the distant but incessant noise of the cascade, reverberated by rocks and mountains. The tops of these, mostly covered with dark pines, are often lost in the clouds, but display on their abrupt and arid sides such irregular and chamfreteed strata, as, from their craggy projections, and the vast heap of rubbish which cover their bases, appear to have been insensibly forced to yield to the ruthless hand of time—the whole forming one of the most solitary and romantic spots of the primordial chain.

The extreme satisfaction I took in my journey from Lyons led me frequently to ramble out of the direct road, to make my observations, which delayed my arrival at Nantua till late in the evening; for which reason I deferred visiting the town and its environs till the next day. But, in order to give an idea of the *Water-fall* noticed in the present description, I have annexed a view of it in N^o V.

Direct in course towards some rocky part of the mountain, the path, into which it throws itself with violence, and thus, by overflowing the rocks, forms another lake of about three miles in circumference.

Leaving for another mile, followed the banks of the lake of Nantua, I took a circuitous route, and reached the foot of a very romantic cascade, which falls from the summit of a mountain that extends to the lake at its northern extremity.

The waterfall is very singular, for instead of precipitating its waters rapidly down the top of the mountain, it flows out from between its strata at about two thirds of its elevation, and with a force considerably as to be heard on the opposite side of the lake.

Depending whether the water really proceeded from the strata, I had the curiosity, in my second excursion to Nantua, to scramble to the top of the mountain which commands the fall, in order to ascertain the fact, and find out its source. There I soon convinced myself that the water proceeded from a small lake, which I could easily distinguish, and which, though the distance was some three miles, appeared to lie in a hollow, so that it was not far from the way of reaching it than by this kind of climbing, naturally produced the appearance of a small lake, which was all weight of the traveler's attention, and was led to the explanation of a singular phenomenon in the arrangements of Nature.

The road here again becomes very good and pleasant, continuing leading along the winding of the lake, which is surrounded by a hill of water from a most singular effect, contrasted with the distant but incessant noise of the cascade, the place is covered by rocks and mountains.

The top of the mountain, which is covered with this place, are often lost in the clouds, but shining on their summit and all sides with light, and crystallized state, as from their crystal pyramids, and the vast heap of ice which cover their base, appear to have been once still forced to yield to the violence of time—the whole forming one of the most solitary and romantic spots of the mountain chain.

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A.B.

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NANTUA AND ITS ENVIRONS.

PERTE DU RHONE.—CHATEAU OF FERNEY.

ARRIVAL AT GENEVA.

THE town of Nantua, though of no considerable extent, is the capital of what was called a *mandement*, or district, which includes eleven parishes, and forms part of the province of Bugey, or *Pagus Busiacus*, as noticed in the preceding chapter. It likewise appears to have been the *Nantuacum* of the Romans; and at that time a city of much greater consequence than at present, if we may judge by some medals and fragments of inscriptions which have been dug up, at different periods, by the inhabitants, in the searches which chance has led them to make.

There were still, before the French revolution, two convents existing in Nantua; one for women, if I mistake not, of the order of Ste. Claire; and the other for men, of that of St. Benoît.

These monks were then considered as the *seigneurs* of the district, and enjoyed an exclusive right of fishing, hunting, levying tithes, imposing or enacting the *corvée**, and other taxes nearly similar to those on the other inhabitants of that part of the country.

This city, considering it as a small provincial one, is tolerably well built; the streets not so narrow as in most of the French towns; the houses, in general, convenient, and many of them handsome. The manner in which they construct their roofs may at first appear singular, as they are composed of a kind of small wooden tiles or shingles, mostly of larch, about nine inches long, and five wide, placed lapping over each other, in the manner of slating. These, from being previously laid in water, and then exposed to the sun, give the roof that greyish hue, which has by no means an unpleasant effect, and resembles a kind of schistus.

* Gratuitous labour, appropriated or due from the vassal to his lord, or *seigneur*.

Nantua Bay, I find, boasts of having, at present, three manufactories, nearly in as flourishing a state as previous to the revolution: one for the manufacturing of gauzes, taffetas, and stockings; another for nankeen (an excellent imitation of the Indian); and the third for printed calicoes or chintzes. These manufactures, having very fortunately retained, in great measure, their original excellence, occasion much activity in this little town; and not only give it a busy and cheerful appearance, but diffuse an air of ease and comfort among its inhabitants.

The lake of Nantua, though not more than four or five miles in circumference, is, as I have before observed, amply stocked with fish, and particularly trout, which are highly esteemed. Its depth, like all small lakes among the Alps, is considerable; and more especially so on its south-east side, where the steepness and abrupt elevation of the lateral mountains are more forcibly felt: a circumstance which not only affects lakes in general, but has a similar effect on all seas; of which it is invariably observed, that their depth is mostly proportionate to the height and abruptness of the mountains which border them. Those which surround this lake, as before noticed, are calcareous; some of them wooded to their summit, and others are in commonable pasture; to which the inhabitants of the valley constantly send their cattle, during the summer, to graze. Their strata, which, with little variation, mostly incline in a north-east direction, are in some places extremely thin; the lower stratum generally thicker than the upper, very much harder, and of a darker hue. They likewise contain marine fossils, though in much less quantity than the mountains of the Vouaches and Jura; and, although I have made several researches in the vicinity of the lake, for the purpose of discovering the *cornua Ammonis*, yet have I never been able to succeed, though that species of fossil is frequently found near the spot where the rapid and extensive Rhône loses itself.

Towards the southern extremity of Nantua are quarries of different sorts of gypsum, mostly of a reddish colour, and not unlike the *gypsum particulis globosis concretum* of Wallerius; also one of grey marble, but, apparently, of too indifferent a quality to be much esteemed. Drawing N° VI. gives an idea of the town, with the adjacent mountains. (Vide the references to the plates, where a further explanation is annexed.)

On leaving Nantua, in order to continue my journey, I followed the banks of the same lake for about a mile farther. The high road regularly continues, for that distance, close to its edge, imperceptibly accompanying the meanderings of the water, which receives an additional beauty from being shaded the whole way by a number of trees.



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Nº 7



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It then enters a narrow valley, which leads to St. Germain le Joux, having on the right the small river of Charris, which conducts to another lake, named Silan.

The beautiful situation of this lake serves to make it most enchantingly romantic; placed, as it were, in the midst of stupendous mountains, in great part covered with furze, brambles, and verdure. One rural and delightful little village adorns its banks; while a number of corn and oil mills, besides tanneries and cloth manufactories, are seen at no great distance, which both enliven this apparently solitary spot (its direct situation being literally a *cul-de-sac*), giving it a strong resemblance to the enchanting lakes of Switzerland, and likewise greatly conduce to the prosperity and happiness of the people. Desirous of conveying a faint idea of this charming spot, I have, in N° VII. given a view of the lake and village of Charris.

From the village of St. Germain le Joux, which takes its name from its proximity to the mountains of Jura, or Joux, I directed my course towards Châtillon. Following a track, for a dozen miles at least, nearly in a continued ascent, sometimes along the windings of a solitary valley, at other times across the elevated summit of a hill or the abrupt sides of a mountain, I at last arrived at that isolated village, where I shall not attempt to detain my reader, but immediately proceed to where the Rhône loses itself—generally called *La Perte du Rhône*.

As soon as I had passed Châtillon, I descended a steep and rugged declivity for about an hour and a half, which brought me to Belle-garde, a hamlet situate in a small plain, forming a central point of union to a number of valleys which terminate in that spot; then approaching the abrupt banks of the Valserène, a torrent that passes through the valley of Chesery, I soon gained a sight of the Rhône, which I had quitted at Lyons, and crossed the Valserène on a high stone bridge there thrown over this torrent, which is indeed terrific; for its thick muddy waters, rapidly sweeping enormous fragments as they roll along, have dug, through the calcareous strata of the lateral mountains, a bed of such an astonishing depth, that to look from the centre of the bridge almost makes the spectator dizzy.

This depth may be accounted for from the incessant friction of the variety of matter, hurried by the rapidity of the current, over strata which have not acquired any great degree of solidity.

Taking then an easterly direction, I immediately entered another contracted valley, formed by the mountains of Credo, which defend it on the north, and by the rami-

fications of the Vouaches on the south. The bed and current of the Rhône occupying the bottom of this valley, the road rapidly ascends the sides of the steep rocks of the Credo, or rather of the hills which serve as the first steps towards them.

The summits of these hills appear to be wholly formed of heterogeneous matter, in which are found imbedded different species of marine fossils; whereas their bases are composed of hard calcareous stone, of a thick stratum, and finer-grained than the upper, without any trace whatever of fossils. I therefore conceive, from having, since that time, had an opportunity of revisiting the same spot, in order to investigate the matter more fully, that those hills must have been, in great part, formed of fragments detached from the lateral mountains; for, besides displaying here and there wide strata of argillaceous earth, *pierres roulées*, or pebbles, and a fine-grained species of sand-stone, placed in some evident and determinate order, in other places these same bodies are found promiscuously mixed together, in a perfect state of confusion, without order and coherence.

The famous *Perte du Rhône* effecting itself at the bases of those hills, the road, or path, which leads to it, is oftentimes so slippery as to render it difficult of access. Here, likewise, among the rubbish and fragments torn from the lateral rocks, are the children of Coussy (a hamlet seated on the summit of the same hills) employed in searching for sulphureous *pyrites*, or fire-stones, and *cornua Ammonis*; besides a variety of petrified shells, which they collect with care, and offer to travelers of every description, in hopes of gaining a scanty pittance.

Let it however be remarked, that I do not suppose the whole of those fossils to belong entirely to the lateral mountains which border the Rhône; on the contrary, I firmly believe them to have been mostly hurried thither by that great *débâcle*, or convulsion in Nature, which has most probably given the extensive and beautiful lake of Geneva its present form and depth;—at least, this is my opinion; how far I may be right, is not for me to determine.

From the bridge of Belle-garde I soon reached the post-house at Vanchi, where travelers who frequent that road commonly change horses. No sooner had I entered the inn than I was surrounded by boys from eight to twelve years of age, who assailed me on all sides, offering their services, and tendering their merchandise for sale, which consisted of stones, pyrites, shells, fragments, fossils, &c. This party, being presently joined by others not quite so youthful, who assisted in renewing the same importunities,

I had no other means of extricating myself to the satisfaction of this civil, but voracious group; than by purchasing a trifle from each; which having done, I dismissed them, highly satisfied with my extreme generosity (as they were pleased to term it). This, elsewhere, would scarcely have been accepted, or even noticed; but in a spot where life partakes of so much simplicity, and the estimation of objects is only in proportion to their utility, the barter of life are very different from what they are in countries where pride, pleasure, and their concomitant legion of vices, create artificial wants and exorbitant desires, which riches cannot gratify, and under which poverty is doubly miserable.

I have still in my possession a couple of the *cornua Ammonis* purchased at that time; one of them of three inches diameter, but so full of copper as to resemble pure metal; the other of about five inches, very like stone.

I then selected for my conductor, out of this jovial party, one who, with an arch and pleasant physiognomy, had facetiously introduced himself as a guide to *Messieurs les Anglais*, and who really, the short time we were together, afforded me considerable amusement, not only from his extreme vivacity, but from his quickness at repartee, and knack at *bons-mots*. He first began by expatiating, in a long harangue, on the beauties of the scene, and particularly on the astonishing phenomenon I was going to contemplate, meaning *the loss of the Rhône*; adding, that if I had the least desire of leaping across that noble river, I might do it at a single jump. This is doubtless possible, from the extreme contraction of the Rhône at a short distance from where it loses itself, which does not exceed three feet; whereas the same rapid and extensive river, in the vicinity of Geneva, according to Monsieur de Saussure, is nearly two hundred and thirteen feet in breadth. But, after seeing the great inclination of the lateral rocks, which are at all times slippery, and the frightful appearance of the abyss into which the river precipitates itself, surely nothing but absolute necessity could have induced me to attempt the experiment myself, or even have allowed my guide to exhibit his agility on the occasion. My young guide remained perfectly satisfied with my placid determination, and returned with me to Vanchi, where after taking some refreshment, I proceeded to the hamlet of Coussy, and began descending the declivity of the same argillaceous and calcareous hills before mentioned, which I found extremely difficult, and rather hazardous, from the quantity of rain which had fallen the preceding day, and rendered the soil slippery and unpleasant. With care, however, I soon reached an extensive

calcareous bank, which impends considerably over the upper or great channel of the Rhône. I use the word *upper*, or *great*, from its being the one into which the superflux of the water empties itself, when its too great abundance prevents its being entirely swallowed up in the abyss, where it vanishes for a time (no uncommon circumstance at the melting of the snows), and in order that I may distinguish it from the other, which is at least two and forty feet lower than the upper, but in which the river runs previous to its arriving where it disappears.

On this terrific bank, three and thirty feet above the bottom of the upper channel, I remained till I had made my observations on the various directions and thickness of the strata that compose the calcareous mountains, which rise with an abrupt ascent on both sides of the channel, carefully examining their structure, and the species of fossils which they contain.

Having so far satisfied my curiosity, I descended from the bank by means of a ladder, erected, at the expense of the inhabitants of the hamlet I had just quitted, for the accommodation of those who are desirous of taking a nearer view of the loss of the Rhône, and for which they receive a trifling gratuity.

This ladder is placed contiguous to the bridge of Lucey, which is thrown across the upper channel, to serve for a communication between France and Savoy,—those territories being there separated only by the course of that river. From the banks of the channel I forded to the opposite side without much inconvenience from the water, the Rhône being at that time nearly swallowed up in the opening of the rock, which I hereafter purpose describing; but my greatest difficulty, and indeed one which considerably impeded my progress, arose from the huge pieces of calcareous stone which entirely cover the bottom of the channel, and which appear to be detached fragments from the lateral rocks and mountains, as they not only contain similar fossils, but have the same grain and colour. This last, being a dark grey, I attribute to particles of manganese mixed with the calcareous substances of which those mountains are formed; and I likewise remarked large masses of lenticular stone, promiscuously placed among them, foreign to the spot where they now stand, but which are of curious structure, from the extreme smallness of the shells which compose them. These obstacles did not, however, prevent my observing clearly that the concealment or disappearance of the Rhône is in part effected by the salient or prominent lower strata of the two lateral mountains, and the immense heaps of rock above mentioned, which, by

filling the *vacuum* existing between those prominent strata, form a kind of vault, or irregular cavity, into which the Rhône sinks, and loses itself; and this vault, or irregular cavity, which is reckoned to be three hundred and fifty feet in length, constitutes the *Perte du Rhône*. There the river disappears, and is only heard rumbling in the interior of the mountain, near to where it again re-appears. But, in order to be better understood by those who have never visited that curious spot, I shall here add some remarks on the course of this noble and extensive river, previous to its losing itself.

Travelers, who have been induced to go from Geneva to Coussy, on purpose to view this surprising effect, must have observed how greatly the bed of the Rhône contracts as it runs between the range of hills which serve as a kind of basis to the mountains of Jura and Vouaches; since, contiguous to Cluse, or Ecluse, a fort situated on the Swiss frontiers, at the entrance of the defile formed by those mountains, the course of that river has scarcely one third of the width which it has in the vicinity of Geneva. It is, however, certain, that the confined state of the current has dug a bed of extreme depth, although through a number of calcareous and argillaceous strata. Many of these strata, differing from each other in hardness, have consequently been worn through sooner than others, and caused the water to form several natural cascades, or falls, which announce from afar the impetuous current of the Rhône.

This diminution takes place so rapidly, that, at the bridge of Grezin, six miles from the fort of Cluse, the same river is only a sixteenth part of its width near Geneva; and this contraction continues for the space of three miles; so that, near to where it disappears, a tall man might perhaps stride across the current, as already noticed, and thus view passing between his legs one of the finest rivers in Europe, which, at no greater distance than twelve miles each way, exhibits, from the impetuosity of its current, and the width of its channel, a most noble and majestic appearance.

Desirous of giving information, yet wishing to avoid prolixity, I shall confine myself to the following remarks, made with care and attention.—First, that the water of the Rhône flows, for some time previous to its loss, with great rapidity, in a deep but narrow channel, dug by its impetuosity through calcareous strata, which, by its friction, are nearly cut into right angles. Secondly, that these strata vary in their species, and that those which are uppermost are in general thinner and softer than the lower. Thirdly, that the bottom of the channel appears to be partly cut through a greyish argillaceous matter, and partly through the soft kind of calcareous stone, but scarcely

ever through the hard. Fourthly, that, at nearly four hundred paces from the *loss of the Rhône*, the water runs tolerably tranquil over a hard calcareous stratum, which it has not worn through, but that, in consequence of the discontinuance of that stratum, the river, with tremendous noise, has there formed a kind of subterraneous cataract. And fifthly, that the channel in which the Rhône afterward runs through, which is still five and thirty feet lower, having probably a very trifling declivity, the current naturally retains after the fall nearly the same placid state, although much confined between its irregular and chamfreted sides, until, again meeting with other calcareous strata which have remained perfect, that is, without being worn through, the river has been forced to make its way under them, thereby disappearing for the space of three hundred and fifty feet, which is the length of the vault or irregular cavity in which it loses itself.

The first time I visited this remarkable spot, which is as curious as it is romantic, I expected that a river, which, previous to its disappearance, is in itself so considerable, and in many places rapid and impetuous, would re-appear with some degree of velocity; but, on the contrary, I could scarcely discern the direction of its course; for, except some trifling bubbles and eddies (occasioned no doubt by the confined particles of air which disengage themselves from the water, and the resistance it experiences among the craggy rocks in the interior of the mountain), it ascends, from its subterraneous channel, with a most surprising placidness, unaccountable, unless upon the following principle:—It may, I presume, be attributed to the form of the channel, which is most probably that of a siphon, with the leg or end, where the Rhône re-appears, more vertical than the other;—a conjecture which seems the more probable, as it in a great measure accounts for the total loss of a variety of objects, such as dogs, pigs, large pieces of timber, &c. which have at different times been thrown in, by way of experiment. But, what is more singular, this stagnant and almost motionless current re-assumes, at a short distance from where it emerges from the subterraneous passage, the whole of its original rapidity, and, by again becoming considerable, continues navigable until it reaches the Mediterranean sea*. But, with a hope of throwing more light on the subject, I have annexed two views, which represent the loss and re-appearance of this noble river. (See N^o VIII. and IX.)

* Perhaps the circumstances here mentioned, respecting the loss and re-appearance of the Rhône, may induce some to believe, that, in one part of its subterraneous passage, it must filtrate through some very porous stratum, or pass through the interstices of immense beds of broken rocks.



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A B



Gratified with exploring this extraordinary place, I by no means regretted the time and trouble I had now bestowed on it, since the day yet sufficed to reach Geneva. I therefore made the best of my way to Vanchi.

As soon as I had left this village, which is about eight miles from the fort of Cluse, I began, imperceptibly, to turn the head of the Jura, leaving the mountains of Credo behind. But here the valley contracts so considerably, that in several places there is scarcely room for the course of the Rhône; and the road, which is better than could be expected, is oftentimes cut in the main rock.

I then proceeded through the romantic little villages of Grezin, Lia, and Lougaretta, rendered particularly picturesque by their situation, being seated at the very foot of the Jura, and on the banks of the Rhône, where its impetuous waters fall, with tremendous noise, into a frightful abyss which they have formed contiguous to those villages.

At Lougaretta I first began to discover clearly the abrupt spiry head of the Jura, and the direction of its strata, which are there nearly perpendicular to the horizon. This singularity is observable in this long range of mountains, as far as to the neighbourhood of Colonge, a village three miles beyond Ecluse; and they likewise stretch to those of the head of the Vouaches, another chain of mountains which skirt the left banks of the Rhône, and which have a similar direction in their strata, also the same thickness, and fossils like those contained in the Jura. What adds very greatly to the above singularity is, that these may be considered as almost the only places in this vast range where the strata exhibit that abruptness and direction, being every-where else nearly parallel to the horizon: besides, several of the mountains belonging to these chains have in many parts an extreme acclivity, which extends almost to their summit.

This analogy and similarity of direction, still more conspicuous in those which screen the defile of Cluse, have at all times excited my curiosity, and led me to believe that they originally formed one and the same chain, it having invariably appeared to me that it really was so. I also conceive that the effect of separation has been produced by some sudden convulsion of the earth in that part of the secondary chain of the Alps (most probably at a time less distant than appears at first), of which the violence and extent was such as to entirely sever those mountains from top to bottom which now border the defile,—and, if so, naturally caused the cavities and irregularities at present exhibited in their strata. These cavities have doubtless been since increased by the current

of the lake of Geneva, which was probably more considerable at that epocha than now, and by the succession of torrents fed by rains, &c. which sweep after each other from the top of those mountains, and throw themselves into the Rhône, as I shall hereafter endeavour to illustrate.

The fort of Cluse has nothing remarkable except its situation, which is particularly interesting, being as though stuck to the bare rock of the Jura, which shelves over a part of its fortifications and outworks; while the remainder of the building hangs as it were suspended above the narrow but impetuous course of the Rhône, on wide calcareous strata, which project from the basis of the mountain. (See N° X.)—Many of these lower strata differ materially from the upper, or those which command the fort, the stones being thicker, more solid, and having fewer fossils contained in them.

The name of *Ecluse*, or *Cluse*, given to this little fortress, is doubtless owing to its being situated at the entrance of a defile, serving as a door or barrier; for the word *clus*, which no doubt comes from the Latin *clausus* (shut), still retains a similar signification in many of the villages of Savoy,—the inhabitants using the words *clus*, or *lus*, for door or narrow passage. All towns and villages thus situated have generally obtained similar appellations. (Vide the author's *Rhætian Alps*, page 27.)

This post is defended by only two or three towers, with bastions, a few battlements, and a couple of modern *flèches*, constructed with dry masonry. It contains an excellent house for the commandant and officers of excise, and two round towers, originally kept for state-prisoners.

In 1536 it was taken by the Bernois from Charles the Third, duke of Savoy, by whom the Pays-de-Gex was then held, and of which this makes part, but was afterwards restored in 1565. It next fell into the hands of the Genevese, in 1589; but, in consequence of the cession of La Bresse, Bugey, and the Pays-de-Gex, to the French, at the treaty of Lyons, in 1601, the fort was delivered up to the French troops.

Having, according to the usual custom, produced my passport, and feed one of the officers of excise for fear of being searched, he, whilst receiving my *petit écu*, which I had carefully slipped, unobserved, into his hand, made me a low and respectful bow, and then, by way of paying me a compliment, though with a very suspicious countenance, added—"That Monsieur was too much the gentleman to conceal any effects, *contre les ordres de sa majesté* *." Had he seriously meant this sarcasm as the criterion of

* Against his majesty's orders.



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my *savoir vivre**, he would have been perfectly right, for not a thing had I in my portmanteau which was entitled to pay duty; but as I neither wished to be detained, nor to see my things turned topsy-turvy, I preferred paying my way through, and quietly pursuing my journey.

On leaving the defile of Cluse, I again retreated from the banks of the Rhône, the high road taking a more northerly direction, following, as far as the village of St. Genis, the foot of the Jura, which extends in a direction tending nearly from north-east to south-west. I then crossed several small villages, rendered particularly rural and romantic from their being seated at the basis of that extensive chain of mountains, which in many places obtrude their steep and abrupt sides on our notice, and have a formidable appearance. At Colonge, the first of those villages, I stopped to change horses, and thence proceeded twelve miles further, along a good road, to St. Genis, which is situated in a bottom, at the junction of the roads to Lyons, Geneva, and Gex. This village was formerly included in the states belonging to the republic of Geneva; but when the exchange took place in 1749, and 1754, between the kings of France and Sardinia, it fell into the possession of the French.

Then turning from the high road which leads to Gex, the capital of the province which bears its name, a part of which I had crossed in my way from Lyons, I took a southern direction, in order to reach Geneva, from which I was only six or seven miles distant. Before proceeding farther, I shall here make some observations on the structure of the hills that border the Rhône, including those I had passed since my departure from Cluse,—the road from that fortress to Geneva being very irregular, and in great measure intersected by a continuation of small hills, which have nearly a similar direction to the chain of the Jura.

Those which screen the Rhône, on each side of its banks, offer an agreeable and pleasing variety, being in a most fertile state, and diversified by objects which add greatly to the romantic beauty of the prospect.

These hills are in general formed of argillaceous earth, sand, pebbles, and a coarse-grained sand-stone, which appear to lie in strata of different thicknesses; and though not every-where exactly parallel to the horizon, are yet invariably so with respect to each other. I remarked, that in various places the pebbles had formed themselves into a kind of pudding-stone, cemented together by an argillaceous matter of some consistency,

* Good breeding.

containing calcareous particles, which effervesce with acids. Their hardness cannot be said, however, to equal that which characterises the same kind of stone in the high Alps. I have likewise found vast quantities of a similar species of pudding-stone on the western side of the wood Labatie, and between the course of the rivers Enne and London.

Among these hills are several quarries of soft sand-stone, which hardens when exposed to the air, of a bluish colour, called *mollasse* by the inhabitants, and used in building. This stone, which resembles the *cos particulis minimis glareosis, mollis, cædua*, of Hallerius, spec. 76, is predominant in that part of the country; for wherever the ground has been dug in the environs of the lake of Geneva, it has been found the most prevailing; and, again, from Cluse to Lausanne, an extent of seventy-nine English miles at least, the same species is more or less perceivable. Something nearly similar to this is observable on the side of Savoy; for at Cologny, Beauregard, and Thonon, the same kind likewise are found; though, beyond the town of Evian, the calcareous mountains which screen the lake are so extremely abrupt, and the depth of water so considerable, that I have not been able to discover any.

This circumstance does not, however, dissuade me from espousing the opinion of several eminent naturalists, who suppose that this species of stone, in some measure, forms the bottom of the lake. Travelers will find in the neighbourhood of Chouilly, a village on the right bank of the Rhône, some beautiful quarries of different sorts of gypsum, well worth their attention. Another remark, which must not be allowed to pass unnoticed, being to the full as interesting to the geologist as the preceding, is, that the sand-stone, pebbles, and sand, as well as the calcareous strata already described, as seeming to form the bases and part of the nuclei of the Jura, Vouaches, Salève, and Voirons, four extensive ranges of mountains, scarcely contain any fossils, and those few totally different from what are found in the upper strata of the same mountains, which are there imbedded in such quantities, that in several places the marine fossils in particular literally form the principal part of their bulk.

In order to continue my route, I returned to St. Genis, and thence to Meirin, where the road which leads to Ferney joins that of Lyons; and though only three short miles from that beautiful and interesting village, I was forced, from the fear of being too late, to postpone at this time the pleasure of visiting it. I was not, however, a stranger either to the spot or the proprietor. Drawing N° XI. gives a view of the village and château which bears its name,—a spot well known, from having been the residence of



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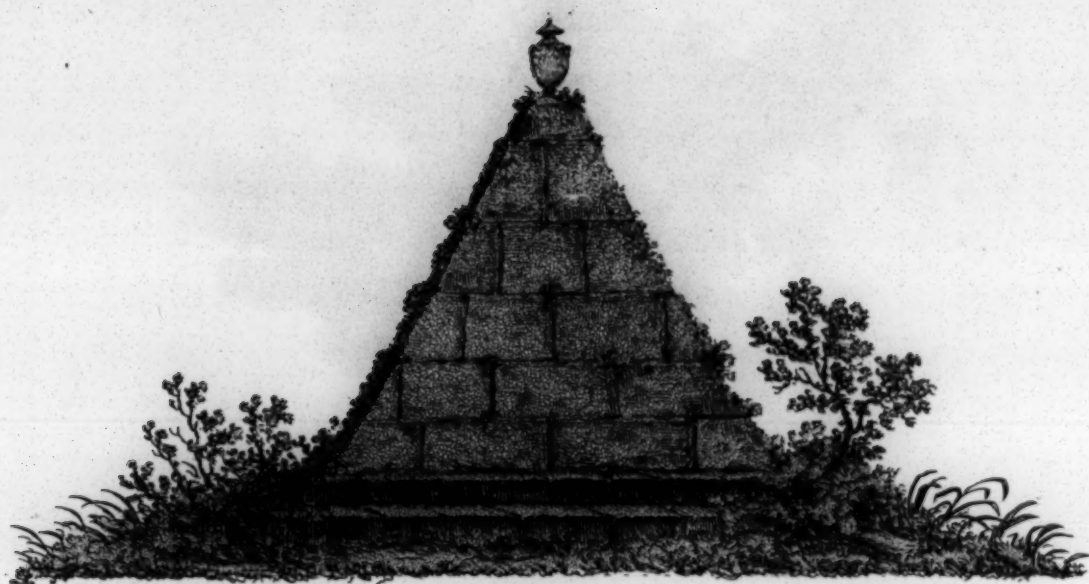


Fig. 2.

Voltaire's Tomb.



Fig. 1.

Roman Theatre at Lyons.



one of the first writers of the age, who was looked on as the guardian-angel of his neighbourhood, and there held in universal veneration. It is unnecessary for me to say who he was, for his name will always find the place it deserves; and those who are acquainted with the productions of his pen, both in philosophy and polite literature, will be at no loss to estimate his fame.

Monsieur de Voltaire's beneficence was such to the inhabitants of Ferney, that, from a poor miserable place when he first settled there, it now resembles a small town, and is become happy and opulent. He likewise took advantage of the influence he at different times enjoyed at court, to obtain for his vassals or tenants the suppression or exemption of the greatest part of their taxes, by paying himself a certain sum to government. Besides this very essential service rendered to the inhabitants of his district, he afterwards succeeded in alleviating the whole province of Gex from acts of servitude, under which its inhabitants had groaned for a length of time,—acts which assuredly dishonoured those who imposed or inflicted them as greatly as those who were compelled to suffer them. His generosity likewise led him to encourage the talents and industry of his poor neighbours, which had till then been relaxed, and almost annihilated, by excess of misery,—giving also great encouragement to Swiss and Genevese artists and workmen, mostly in the watch-making line, who were desirous of establishing themselves in his village. So rapidly did he succeed, that in a short time, having built houses for them, Ferney was filled with workshops in full activity, where a considerable commerce in clocks and watches was carried on. In those shops many youths were taken as apprentices, who in a few years became useful members of society, and of course contributed towards fulfilling the views of Voltaire, by adding to the happiness and prosperity of his little community, of which this scientific man considered himself as the parent, rather than the *seigneur* or lord.

This village had been totally changed by Voltaire's residence in it, and its inhabitants still retain nearly the same affluent and comfortable appearance as during his life-time,—an effect doubtless owing to the activity and industry displayed through every part of it. This forms so striking a contrast to the extreme poverty and indigence exhibited in most of the villages of the same province, that few travelers visit Geneva without previously stopping at Ferney,—not entirely by way of paying tribute to the memory of that great man, but to enjoy a sight of the ease and comfort which characterise this beautiful spot. It is certain that the local situation of Ferney considerably

favoured the philosopher's projects, it being a kind of isthmus, the narrow part of which stands on the French frontier, and the rest on the states of Switzerland and Geneva. The houses are well built; and the village, taken all in all, *bien percé*—standing as it were at the junction of four public roads. The château is handsome, without magnificence; and the external architecture, though simple, offers to the view an excellent well-finished habitation. The library is extensive, and stored with valuable books; the apartments numerous, richly furnished; and the terrace, which is in front of the castle, superb, meriting the traveler's particular attention, not only from its elevation and extent, but from the noble prospect it commands. The view plunges on the beautiful lake of Geneva, distant about three miles and a half, and extends itself over a fertile well-cultivated country, in part laid out in vineyards and plantations, which ornament its banks, and of which the gentle tint of colouring harmoniously contrasts with the blue transparency of the lake,—while in the back-ground the sight enlarges and multiplies, and the eye is only stopped by objects still more sublime. Among these are the grand glaciers of Fancignie, of which Mont-Blanc, truly styled the giant of the Alps, before which every stupendous peak that surrounds it seems to bend, majestically rears his head, and occupies the centre.

On the eastern side of the court-yard which leads to the château, stands a small church, or rather chapel, built by Voltaire, with the following inscription over the door, written in large letters:

DEO EREXIT VOLTAIRE, M.DCC.LXI.

and contiguous to the chapel, a kind of mausoleum, called *le Tombeau de Voltaire* *, a sketch of which I shall annex by way of vignette (See plate XII. fig. 2.). Though he was not buried there, it is most probable that, at the time he had it erected, he meant to end his days in this enviable retreat.

* Voltaire's tomb.

GENERAL IDEAS
ON
THE ORIGIN OF GENEVA.

ITS SITUATION, FORM OF GOVERNMENT, AND INTERNAL COMMOTIONS; WITH
OBSERVATIONS ON THE NATURAL HISTORY OF ITS ENVIRONS.

THE road from Nantua to Geneva being from forty-eight to fifty English miles by computation, traversing an irregular, and in some parts a mountainous country, it was with difficulty that I reached even its vicinity previously to the shutting of the city-gates,—a ceremony which, being generally regulated by the setting of the sun, took place at that season of the year at half past eight o'clock.

This caution, rendered absolutely necessary by the locality of Geneva, being as it were wedged in between the states of France, Savoy, and Switzerland, is however the cause of much inconvenience, not only to its inhabitants, but also to persons whose commercial concerns oblige them to frequent that city, and to travelers in general, this being one of the principal roads from Italy to Germany: for the inhabitants trade, for the most part, either in jewelery, engravings, plate, leather, or watches, though particularly in the latter, in which a considerable traffic is carried on, as may be easily imagined, when the reader is informed that nearly one third of the women, as well as men, are employed in the watch-making business. But by this necessary precaution they are often precluded from taking, after their day's labour, that share of fresh air and exercise which is necessary for the assiduous and sedentary state of their lives. It is also detrimental to travelers, who are thereby forced, in case they should not arrive in time, to remain at Carronge in Savoy till the next morning, where accommodations are not quite so comfortable as at Geneva or in the Pays-de-Vaud.

As for myself, who had previously resolved to make my abode at Sécheron, a small village nearly contiguous to Geneva, on the side of Switzerland, the above regulation

could in no wise affect me; but still I felt anxious for those mechanics and workmen who were hastening, in apparent anxiety, with their wives and children, lest they should arrive too late; for, when the gates are once shut, and the draw-bridge raised, the case is hopeless: neither apology nor entreaty can be of any avail; and, unless upon an occurrence of extreme urgency, or by express command from the principal syndic, with whom the keys are deposited every evening, and who cannot grant them without consent of a council convened for that purpose, these gates must remain shut.

The hôtel, or inn, where I had taken up my lodging, still kept by the same persons, named Déjean, I found, as was at that time generally the case, thronged with strangers, mostly English, who, like myself, had chosen that situation as much from the civil and obliging attention of the owners, and their convenient and comfortable accommodations, as for the reasons above mentioned; so that, instead of an apartment which I expected, in the main body of the house, to my great satisfaction I had one procured in an adjacent building, apparently isolated, though belonging to the same people.

Here I had no sooner taken possession of my apartment, than without attending, from fatigue, to either aspect or situation, or even considering that it might probably be seated on the banks of the lake, and of course likely to command one of the finest and most extensive prospects of the glaciers of Savoy, and the surrounding country, I eagerly sought the repose I stood so much in need of. But what was my astonishment, when, on my being awakened soon after sun-rise by the reiterated report of fire-arms and the sounds of martial music, hastily running to the window, one of the most noble and majestic landscapes that man ever beheld offered itself to my view. I felt an instantaneous sensation of surprise and admiration, such as I had rarely experienced.

It is certain that the surrounding objects were in themselves amply sufficient to render the scene highly gratifying, and, I may say, fascinating; yet the circumstance which had at first aroused me, and which I shall hereafter endeavour to describe, assisted most forcibly, by combining the taste and amusements of the Genevese, to complete the effect.

Let my reader for a moment suppose the frozen summits of the mountains of Fancignie gilded by the brilliant tints of the sun, one of the most beautiful mornings in June, lighting up not only with a ruddy glow that part of the Alps, but unveiling the whole face of Nature, and brightening every colour of the landscape,—the air serene, and the atmosphere impregnated by the flowers and blossoms which the trees and

meadows still displayed. While one side of this noble lake washed, with its transparent waters, the walls of my habitation, the opposite side watered the basis of the rich and fertile hills of Cologny, which may be said to serve as its southern boundary. Looking up, in almost a straight direction from where I stood, I beheld the elevated and stupendous Mont-Môle far distant in the back-ground,—which, though, even at that hour of the morning, in part immersed in a purple vapour, yet exhibited its spiry summit, rising like a majestic pyramid, taking the beautiful hills of Cologny, as it were, for a basis. On the other hand, the naked and rugged mountain of Salève, and the well-cultivated Voirons, seemed to have separated only in order to display, by the contrast of their colour, more brilliancy and magnificence in the sublime prospect of the Glaciers, discernible between that separation,—exhibiting an astonishing and noble amphitheatre of mountains, rising rapidly on all sides, each more elevated than the other, and crowned by that colossus of granite, snow, and eternal ice, Mont-Blanc, whose extreme elevation commands both wonder and admiration.

As it is impossible to conceive any prospect more rude, bold, and magnificent, than the one just described, I hope I may be excused for suffering those objects to have so occupied my attention, and so absorbed my ideas, as to divert me from the cause which had roused me so early to the contemplation of the scenes of Nature. To this, however, I soon returned, and here witnessed a sight, which as much fascinated my heart as those inanimate objects had my senses; for I freely acknowledge, that I have never been able to be present at any kind of popular or national amusements or recreations whatever, without experiencing much enjoyment and satisfaction,—sentiments which are better felt than described, and which make me as much participate in their happiness as if I were its chief promoter. Yet are these sensations rendered more lively or pure, in proportion as the happiness of each individual does not too forcibly contrast itself with the misery and poverty of the mass who compose the spectators. No contrast of this kind existed at this time. The Genevese then forming, by their institution, as it were, one family, the poor were invariably assisted by the opulent, and each individual enabled to procure, on the Sunday, some rational and innocent amusement or recreation, suitable to his situation. But, alas! how changed, ye ill-fated and unfortunate people!—once so happy, yet so soon rendered miserable and wretched by too great a share of levity, ambition, wealth, and fallacious speculations. What misfortunes might ye not have avoided, had ye been satisfied with your lot, by comparing your comfortable situation with the striking con-

trast exhibited by some of your poor neighbours, and known the benefits of your state! Should ye not, instead of opposing yourselves to the laws established and adopted in 1782, have tried to have maintained and supported them, and seen that they were properly executed? On the other hand, had your magistrates, instead of being desirous of increasing the powers already granted by those laws, made the trifling sacrifices required by the then existing circumstances, would not the calamities which have, since the year 1790, desolated your republic, as well as the turbulent contentions and anarchy which have taken place in your government, which may always be considered as a prelude or forerunner to revolutions, have in all probability been avoided?

Distractions and encroachments are too often accelerated or instigated by the ambition, ignorance, and avarice, of a few individuals, who, in order to realise their vicious and atrocious designs, commit every species of horror and extortion in the name of the people and nation whom they thus so cruelly deceive and prey upon.

But, to return to the cause of my being awakened so suddenly the morning after my arrival.—It may be necessary to inform my reader, that it being Sunday, a day in general set apart by the Genevese for rural amusements and parties on the water (though seldom till after religious service), the report of fire-arms, &c. which I had so unexpectedly heard, was occasioned by several of the inhabitants being, even at so early an hour, in their boats, or rather small barges, ornamented according to the taste of the owner. While gradually spreading their sails, the variegated flags, gaily floating on the lake, displayed their colours to the greatest advantage,—all together forming a beautiful and pleasing effect, bringing to my mind the regatta at Venice.

These parties were generally accompanied by music, and small pieces of artillery, employed for the purpose of saluting each other as they passed, as well as those whose villas are seated on the banks of the lake. It was also customary to take provisions on board, and to stop at some of the most picturesque spots, with which that beautiful lake abounds, and there spend the greatest part of the day in simple and innocent amusements. I do not hesitate in styling them innocent; nor can I sufficiently extol the good manners or polite morals and courtesy of the female Genevese,—although at first they may probably make a contrary impression on the mind of a common observer, on account of the extreme liveliness, vivacity, and affability displayed in their character.

Thus did chance throw in my way what induced me to form a favourable idea of the happiness of the Genevese: but having, some time after, had occasion to make a longer

stay at Geneva, and of course to be better enabled to judge of the manners and genius of the people, I shall here produce the fruit of my researches as to what relates to, or is connected with, the leading facts of their political history, previous to my entering on their character, industry, commercial resources, &c.

From the most authentic accounts, it appears that the city of Geneva was known to the Romans by the name it now bears, but that it was afterwards corrupted into *Genbenna*, or *Ceneva*, and even to that of *Genabum*, as is found in several copies of "Antoninus's Itinerary." Its origin is so ancient, as to render it impossible to fix its epoch with any certainty; though it seems to have existed at as early a period as any of the cities in that part of Europe; and that, previous to the conquest of the *Allobroges* by the Romans, about one hundred and twenty-two years before the Christian æra, it had for a length of time been esteemed one of the principal towns of that country. Indeed some historians go farther, and pretend that it was even the capital, and that Vienne in Dauphiny, or *Vienna Allobrogum*, was not considered as the metropolis till after the entire subjugation of *Gallia Narbonensis* by Julius Cæsar (*Vide* D'Anville's Notice de la Gaule): for which reason, Christianity having been introduced there towards the middle of the third century, the bishops who were afterwards sent became suffragans to those of Arles, and since of Vienne.

It is however evident, that Geneva was not so considerable at that epoch as at present; since, in the time of the Romans, its extent went no further than that part of the city which now stands on the left bank of the Rhône. Hence it appears, that to Julius Cæsar may be attributed the annexation of the small island formed by the two branches of that river, where it breaks out of the lake, on which he built a square tower, which is still extant, and nearly entire. It is not improbable that this tower may have been extremely serviceable, not only in protecting the city on the side of the Helvetii, but in flanking and defending the head of the intrenchments, or walls, erected by that general along the course of the Rhône, extending from Geneva to the basis of the Vouaches, opposite the defile of Cluse.

The remains of these intrenchments prove, by their solidity, construction, and judgment in directing them, the skill and military talents of him by whose command they were erected,—who had not only learned the art of subduing so extensive a part of Europe, but, in general, to behave as a lenient conqueror to those whom he had subdued.

Julius Cæsar tells us expressly for what purpose he built this wall, viz. to confine the Helvetii within their own limits, on being informed of their design to emigrate in one body into Gaul. (See Comm. De Bello Gall. lib. i. "à lacu Lemano, ad montem Juram, murum, in altitudinem pedum sexdecim, fossamque perducit"). The Helvetii did, notwithstanding, pass into Gaul; but Cæsar pursued and defeated them, and obliged the miserable remainder to return and re-occupy their own country. The Romans, having soon after extended their conquests, and subdued the different nations which inhabited the banks of lake Lemane, as well as the whole of the Helvetii, or ancient Swiss, they made Geneva one of their principal repositories for arms. They then not only strengthened, but embellished it, and encouraged by their example its trade, clearing and cultivating the waste land in its vicinity, making it thereby a considerable, and, in a short time, one of the chief cities of *Gallia Narbonensis*.

Some historians have been led to suppose, that the Genevese originally worshipped the sun, and that under that emblem a magnificent temple to Apollo had been erected, and at that time held in great veneration by the Allobroges. Be this as it may, the only circumstance which seems to corroborate the above suggestion is confined to a few inscriptions, or rather verses, in honour of that god, found near the spot where St. Pierre, the principal church at Geneva, now stands; as likewise the head, or figure of the sun, in white marble, discernible on the internal wall of the same edifice.

These fragments are not, however, the only reliques of antiquity which have been found, both within and without that city; for, at different periods, many have been the vestiges of ancient grandeur discovered, which, doubtless, denote the flourishing state of Geneva previous to the decline of the Roman empire,—such as sepulchral urns, bass-reliefs, lamps, medals, military weapons, &c.

But at that melancholy epoch, this city, as well as most of those in Gaul and Italy, shared the same fate, and were sacked at various times by the hordes of barbarians, who, for a long series of years, desolated the western empire.

It then fell under the power of the Burgundians, whose kings made it, for a time, their place of residence, thereby preserving it from new troubles and vexations; so that it imperceptibly began to recover a part of its fallen prosperity,—till the Franks, succeeding in destroying the first kingdom of the Burgundians, took possession of the whole country, and sent governors to Geneva, who, by cruel and atrocious acts, produced a renewal of calamities.

Fortunately, however, for that city, as well as for the greater part of Europe (whose inhabitants were involved in all the horrors of servitude and misery, which they endured with great patience, under a swarm of petty tyrants, who had assumed to themselves the right of governing with a rod of iron), there arose a Charlemagne, who may be said to have, in many instances, imitated the example of Julius Cæsar; for, being as great a warrior as legislator, and animated by the same spirit of glory and conquest, feeling likewise for the deplorable situation of Europe, he resolved on putting an end to their miseries, and healing the wounds of conquest, by abolishing the kingdoms formed by the descendants of those barbarous hordes who had heretofore inundated the southern parts of Europe, and who actually, at that time, possessed the richest provinces of France, Spain, and Italy.

This great general, after many glorious victories, being desirous of expelling the Lombards from Italy, or rather of annihilating their kingdom, again followed the example of Cæsar, in making Geneva one of his chief repositories, or *places d'armes*, on this side of the Alps, and also a central point of union for the different columns of the army destined to cross Mont-Cenis. Charlemagne, having completely succeeded in this famous expedition, as well as in all those he afterwards concerted, paid to Nature, after a long and successful reign, the tribute from which neither rank, courage, nor talents, can exempt us.

In the dismemberment or general division of his vast and extensive states, Geneva, after his death, was at first included in the kingdom of Arles, and afterwards made part of the new kingdom of Burgundy. This last, having had but a short duration, soon became united to the German empire.

Owing, however, to the vast extent of the western empire at that time, and the trifling authority the emperors then enjoyed, they being as it were under the *ferula*, or immediate controul of the popes, scarcely possessing sufficient power for the enforcement of their laws and edicts even in the provinces contiguous to their own residence,—consequently those who were at a great distance from the seat of government were left entirely to the mercy and direction of the bishops and nobles, who were alternately contending for absolute power, some under the mask of religion, and others under pretence of their employ or appointment as governors or grand-officers of the empire; so that these provinces soon after detached themselves from the emperor, and threw off all obedience to his government and authority.

The latter, after some time, being desirous of recovering his authority, and of compelling them to return to their former dependence, first began by attracting or enticing the affections of the people, in order to become popular; for which reason considerable immunities and prerogatives were granted, in the hope of gaining them over to his interest, that they might assist in their turn in reducing to subjection those who had, as he considered, usurped the sovereignty.

This step, though political in itself, occasioned vast confusion in those states, fomenting and instigating intestine commotions, cabals, and conspiracies, between the bishops, nobles, and people, who at all times participated in those disputes. Some of the bishops, more cunning than the rest, keeping in sight their original project, embraced the earliest opportunity of taking advantage of the weakness of many of the emperors, aided by the ignorance of the nobles and bigotry of the people, which soon enabled them to appropriate not only the entire spiritual, but also the temporal jurisdiction of their different dioceses; and thus they succeeded in being acknowledged absolute sovereigns of those provinces. In like manner were originally formed the major part of the sovereign bishoprics, or *évêchés souverains*, now existing in Italy, Germany, and Switzerland.

Hereby fell Geneva and its territory under the spiritual and temporal jurisdiction of its own bishops, who held the right of coining money, and the enjoyment of every privilege of sovereignty, with the exception of some few immunities which the people still retained, and of which they were extremely jealous; and though it appears that these bishops' rights of sovereignty may be traced so far back as the emperor Frederic the First, in 1162, yet were their reigns scarcely ever free from external or internal commotions. Their intestine disputes arose, in general, from the jealousy of their subjects, continually contending for a preservation of their liberties,—and their external from the policy of the neighbouring petty sovereigns, who, by pretended right, endeavoured to enlarge their dominions at the expense of the bishopric. But, of all their external enemies, none appeared so dangerous or formidable as the counts of Savoy, who, by alliance and conquest, had already annexed to their territory several provinces contiguous to the bishopric, and even appropriated the greatest part of the Genevese comté, claiming an exclusive sovereignty not only over that district, but also over the city itself,—a claim which the descendants of that illustrious house have, at different periods, attempted to establish by lenient means, as well as by force of arms,—and which, for several centuries, has occasioned

a series of cruel wars between those states (*Vide* Berenger's or Spont's History of Geneva).

The counts of Savoy having at last succeeded, by a treaty concluded in 1290 between Amé the Fifth, count of Savoy, and William the First, bishop of Geneva, in procuring to themselves and their descendants the title of *Vidame*, or *Vice-dominus**, of the Genevese state, they acquired such influence in the bishopric, as to gain a majority in their favour; so that oftentimes the episcopal dignity not only fell to the younger branches of their family, but even to their natural children.

This influence and ascendancy of course formed a strong and decided party at Geneva for the house of Savoy; and there is scarcely any doubt, but that, with a little more policy and indulgence on the part of the dukes of Savoy, Geneva would, in the sequel, have voluntarily put herself under their government; and thus might they have quietly taken possession of a city, even at that time of commercial note, which they have never since been able to subjugate. But, having unfortunately neglected those means, they consequently created two parties, who often engaged in quarrels, which, without ending in any permanent advantage, served to produce fresh calamities to the state.

One of these parties was denominated *Mammelus*, from *Mamalukes*, who fought for the house of Savoy, in allusion to the band of slaves who combated under the sultans of Egypt; and the other the *Huguenots*, from the German *eidgnoss*, combined or confederated, who maintained the rights and liberties of the people,—a name afterwards adopted by the French protestants in the time of the religious wars, which began to desolate that country in the reign of Charles the Ninth.

The latter of these parties, being by far the weaker, secretly came to a resolution, at the commencement of the sixteenth century, without consent of the house of Savoy, to enter into an alliance with the canton of Freybourg, and soon after with those of Berne and Zurich,—which, consequently, so increased their strength, as to occasion much hatred and jealousy on the part of Charles, the then reigning duke of Savoy. Not content with bitterly inveighing against this infraction as *vidame* of the bishopric, that sovereign had recourse to acts of violence against several of the inhabitants, which acts were unfortunately renewed almost immediately after by their own bishop, Jean-Louis, and again repeated by his successor, Pierre de la Beaume, who, contrary to the established laws of the constitution, dared

* Sovereign lieutenant, or judge, of a bishop's temporal jurisdiction.

to enter the senate or council, attended by a numerous guard well armed, arbitrarily deposing such magistrates as he deemed of a contrary opinion to himself, replacing them with such as he thought proper, imposing new laws, &c. &c.

These arbitrary and violent measures, however, produced an effect very different from what had been expected by the party of *Mammelus*, or Mamalukes; for even several of the magistrates, who were previously attached to the house of Savoy, immediately joined the Huguenots, and, by so doing, accelerated the revolution, which was projected to annihilate the ancient government and the catholic religion, the latter of which had been their established tenets ever since the middle of the fourth century.

Matters coming to this crisis, and the bishops daily losing their ascendancy, their ecclesiastic ruler, alarmed at the rapid progress of the new doctrine of the reformers, and even apprehensive that his life was in danger, made his escape, in 1533, by means of a subterraneous passage, and got safe to Anneci in Savoy, whither the see was afterwards transferred, and where it actually existed when the French took possession of that country in 1792.

It is therefore from this epoch that the origin of the Genevese republic may be dated, the form of which, previous to the changes which have since taken place, was an absolute democracy; for the Genevese, almost immediately after the flight of their bishop, named two councils or colleges, charged with the administration of government.

On the 27th of August, 1535, the Council of Two Hundred adopted the reformed worship introduced by William Farel, jointly with one Froment, Bousquet, and Lambert. The *assemblée-générale* soon after following their example, the catholic religion was abolished. The year after, John Calvin happening to be at Geneva, and Farel recommending him as the properest person to complete what they had begun, he acceded to their request, and not only contributed, by his abilities and learning, towards the settling of their new doctrine, but even undertook to complete the democratic plan of government, on the adoption of which they had just resolved.

The Genevese, after so decided a change in their religion and government, enjoyed, for a short space, some little tranquillity; for the necessity of resisting their external enemies had compelled them to unite internally. This calm, however, proved but of short duration, owing to the dukes of Savoy, who, still contending for their claim of rights over the republic, were continually waging war against them, and taking every opportunity of dismembering their country; so that, had it not been for their alliances

with the Swiss cantons, they must inevitably have yielded to enemies, whose power and dominions were incessantly increasing. To this it must be added, that their very critical situation inducing an universal conviction of the necessity of unanimity and concert in council and operation, the Genevese for a time buried all private quarrels and secret animosities in oblivion, and, with heart and hand, employed themselves in providing means of defence against the common enemy, and in establishing the new form of government.—Success was the consequence.

Thus we see, in the history both of ancient and modern governments, that republics in general have originated in the tyranny and arbitrary power assumed on the part of those who governed, and that their establishment has been assisted by the opposition they were at first compelled to encounter,—which, by proving the weakness of the few, when exerted against the general will, has at last crowned the popular struggle with success.

The Genevese afterwards increased their alliances with the rest of the Swiss cantons, and were taken under their protection, though without the right of session, or voice in their General Diet. Hereby the Swiss wonderfully contributed towards saving the republic from impending ruin, by assisting her in her wars, and oftentimes acting as mediators between her and her powerful neighbours, the dukes of Savoy.

I shall pass over in silence the details of those wars, and content myself with observing, that the last danger the Genevese experienced of having their religion and liberties crushed, happened in 1602, when an attempt was made on the city in the night of the winter solstice, which, from the manner of its being made, was called the *escalade*. For a body of Savoyards, privately assembled by order of Charles Emmanuel of Savoy for the purpose of taking it by surprise, had made every necessary preparation with such secrecy, that the danger of the inhabitants was most imminent, and the discovery was the effect of mere chance, the troops actually having not only approached the walls unperceived, but even mounted the bastions, and escaped detection till some hundreds had entered the city.

Such, however, was the unanimity and ardour with which they were attacked by the citizens, that they were immediately repulsed, and almost all massacred.

At length, however, on the 21st of July, 1603, the same Charles Emmanuel the First, duke of Savoy, concluded, by the intervention of the Swiss, a treaty at St. Julien, a small village in the vicinity of Geneva, by which peace was established between those states,

and their boundaries settled as they had been in 1570; but it was not till 1754 that Charles Emmanuel the Third, of Sardinia, entirely acknowledged the total independence of the republic, and definitively fixed its limits, by making several changes for that purpose.

A peace so fortunately accomplished, and which to all appearance opened a dawn of happiness and tranquillity to the Genevese, most unexpectedly turned out the very reverse; for from this epoch may be dated the internal commotions which have so cruelly desolated this little republic, from the commencement of the present century until 1782, at which time they in some measure were terminated by the intervention of three neighbouring and powerful nations, viz. France, Sardinia, and Switzerland, who sent troops to restore tranquillity:—this was achieved by replacing at the head of the government, or in the great and little councils, the magistrates who had been excluded or banished by that class who called themselves *Representatives*, aided by the *Natifs* (so called from being the children of foreigners born at Geneva, but excluded from holding places under the Genevese government).

Without attempting to give a history of various events, which, from having been an ocular witness to many of them, I am fully enabled to do, I shall confine myself to barely noticing the famous or grand contest, which broke out about that time,—a contest occasioned by the compilation of a code, considered as militating against the principles of their constitution, by the edict of 1768,—a point on which the *representatives* and *natifs*, the two parties who then divided the city, were continually at variance, and which led each to have recourse to arms in support of their respective opinions.

The former being by far the weaker, but assured, from their opulence, of the support and influence of the French ministry, engaged them, jointly with those of the other two powers, to march a large body of troops to their assistance. The *representatives*, however, in spite of their vast appearance of resistance for the defence of the city, quietly opened their gates to the allied troops, who thus entered without obstacle. In this manner were the Genevese reduced to accept of the mediation of foreign powers, submit to their magistrates, and be calmly disarmed, with strict injunctions against assembling as they were wont to do, or even attempting to speak on affairs of government.

Being by these regulations deprived of their clubs and meetings, the magistrates found it advisable to allow the establishing of public coffee-houses, for the accommodation

of the inhabitants, rendering however the proprietor, or keeper of the house, responsible for any disturbances or revolutionary discourses which might occur under his roof; and at the same time forbidding any person to remain in the same after ten o'clock. Every person, likewise, was liable to be conveyed to the guard-house, who was seen after that hour in the streets without a light.

During my stay at Geneva, the allied troops, aided by the magistrates of the city, and the three plenipotentiaries, were in the act of forming a code of laws, which was presented, on the 4th of November, 1782, to the councils or colleges at that time assembled, who accepted it, on the allies becoming guarantees for its execution.

This new code, instead of being entirely democratic, was a kind of partial aristocracy, inasmuch as the executive power and public administration were to reside in, or be confined to, four councils:—1st, To that of Twenty-five, called the Senate, or *Petit Conseil*, to whom belonged the exercise of the *haute police*, acting as supreme in all political, æconomical, criminal, and civil causes. 2dly, The Council of Sixty, who were properly a deputation or commission only from the Council of Two Hundred, who seldom assembled, unless in cases of great importance. 3dly, That of Two Hundred and Fifty, or the Great Council. These judged, *en dernier ressort*, all matters of inferior police, civil causes of importance respecting the taxes, the expenditure of public money, &c.; in some respects not very unlike the English House of Commons: And, 4thly, The Military Council, consisting of one syndic, elected annually, one colonel, one lieutenant-colonel, a major, one auditor, and six members, taken from the Two Hundred and Fifty, or Grand Council, who remained invested with authority for six years. To this council was given the entire inspection of the garrison (containing one foreign regiment, at that time created), including the superintendance of the fortifications, out-works, arsenals, and military stores, as also the internal and external police of the republic.

In order to be eligible to either of these councils, it was necessary to be a citizen of five and twenty years of age. What I mean by citizens, were those whose parents or relatives already enjoyed the right of *bourgeoisie*, the better to distinguish them from the latter, who, though excluded from filling any public functions in the Genevese government, were yet held in greater consideration, and had more privileges than the *natifs*, who were not allowed a seat in the General Assembly; whereas the *bourgeois* had a right to assist at the general election.

To all these changes, both in the magistracy and military department (added to the expenses of keeping foreign troops in pay), to the increase of taxes for their maintenance, to the disarming of the people, and bereaving them of their right of meeting and discussing as usual, may be attributed the discontent which so immediately succeeded, and which sufficiently indicated, during my last stay in that city, that these new regulations would be obeyed no longer than submission to them was compelled by force, and that the people at large only waited for a favourable opportunity of raising fresh disturbances. This probability has indeed been but too unfortunately confirmed since 1790; for, no sooner had the French revolution been effected, than, the Genevese having nothing to fear from that power, many of the discontented citizens, who had retired into voluntary exile in 1782, returned, and, uniting with their fellow-citizens, the regulations formed in 1782 were, in a short time, totally overturned. This revolution was accompanied with the perpetration of horrors and massacres, which have cast an indelible stain, not only on those by whose orders they were perpetrated, but on those who so shamefully deserted their country in the hour of peril, instead of remaining at their post and employing their best efforts to conciliate the minds of the people, and to endeavour to stem the torrent of discontent by their example, courage, and talents. These fugitives, on the contrary, limited the service they owed their distracted country to the writing of a few wretched pamphlets, which served more to gratify the private pique or vengeance of a few individuals, than to promote the general good.

GENEVA IN CONTINUATION.

REMAINDER OF ITS HISTORY.

ACCOUNT OF ITS CITY AND LAKE.

JOHN CALVIN, who had at first appeared only as a secondary actor in the religious and political reform which took place at Geneva in 1535, soon became its principal agent and zealous advocate, as is evident from the strong and necessary laws proposed by him to the Councils, and immediately adopted, as well as by the wise and prudent institutions established, in order to accomplish a work of such magnitude as the Reformation.

The law which appears to have most decidedly contributed towards establishing and supporting the new doctrine, as well as its democratical principles, may be said to be that which tended to put an entire stop to the theological disputes which had begun already to divide the inhabitants of Geneva, and which, by introducing a schismatic spirit among them, might probably, in a short time, have totally overturned the measures taken to accelerate the Reformation*.

That able and celebrated reformer, apprehensive of the danger, and desirous of obviating the difficulties, which he thought would arise from such a circumstance, recommended the forming a council, or body, charged with ecclesiastical discipline, entrusted with the care of watching over the morals of the people, and with the power of decision in all theological questions.

This institution was no sooner put into execution, than, in a short time, order, regularity, and tranquillity, were restored,—and Geneva became, from its unanimity and comforts, an asylum to a number of men of letters and merit, who were persecuted for having embraced the new doctrine, which had already diffused itself in Germany and France, and was making great progress. Calvin, taking advantage of so fortunate a

* But in this Calvin betrayed a spirit as intolerant as the church of Rome; and the burning of Servetus will remain an eternal blot on his memory.

circumstance, established an academy, where he presided in person, and gave lectures on theology, aided by Theodore Beza, who was appointed rector. This academy, which still exists, soon acquired so great a reputation, that it insensibly became, if I may be allowed the expression, a nursery for people of distinguished merit, having produced some of the ablest men in Europe,—men who have enlightened, by their extensive knowledge, and honoured by their talents, the country they had adopted, and the age in which they lived. To this prudent and judicious institution it is owing, that the republic of Geneva has supplied, out of her own bosom, and continues, even at present, to possess, a greater number of men of talents, perhaps, than any other state in Europe, considering the extent of its territory.

At present, many students are continually sent, to Geneva, from various parts of Europe, to finish their education,—a preference in great measure owing to the estimation in which the professors of that city are held, and the extreme facility with which the various branches of study can be pursued, besides the opportunity of continually mixing with people of information, good company, and *bon-ton*, in general to be found in most of the Genevese societies.

Even without these advantages, Geneva is of itself particularly interesting by its situation, being seated at one of the principal entrances of the Pennine Alps, not far distant from the basis of the glaciers of Fancignie, and at the extremity of a most extensive lake, which stands in a beautiful valley, screened on both sides by stupendous mountains. This circumstance certainly renders it a most desirable and useful station for the naturalist, who may enjoy the profusion of different objects belonging to the three kingdoms of Nature, which abound in its vicinity, and which no doubt determined the celebrated Jean Bauhin, physician and botanist to the duke of Wittenberg Montbelliard (well known by his *Historia Plantarum Universalis*), to visit Geneva in 1566; as did also John Ray, that eminent English naturalist, who, during his residence in this city, employed himself in similar pursuits with the greatest success; since which, Burnet and Addison, his countrymen—the great Haller—Voltaire—the inimitable, but too irritable misanthrope, Rousseau (a citizen of the republic)—the abbé Raynal—Lavater, &c. have at different periods honoured Geneva with their presence; besides many other travelers of distinguished merit, of almost every nation of Europe, who have all invariably, and, I may justly add, unanimously, agreed in commending the morals, industry, and information of the Genevese, and in extolling, with enthusiastic

ardour, the beauty of the surrounding country. Those scientific men very much accelerated, by their example and researches, the progress of science, which is now unremittingly pursued by some of the ablest men in Europe.

The Council, or body entrusted with the ecclesiastical discipline, before mentioned, having more than once been found to have preserved the republic, by retaining and encouraging among the inhabitants their original integrity and simplicity, carefully watching and attending to their morals and manners, maintained it, if possible, with additional force and energy, and increased the number of its members. That institution still exists, though under a different appellation, being now called the *Consistory*, which is composed of a society of pastors, or clergymen of the Reformed Church, and a certain number of laity, named *Anciens*, taken from the Council,—in some measure not unlike the *Areopagus* at Athens. To them are entrusted the general inspection of marriages, registers of births, crimes of adultery, suits of divorce, &c. with the power of rewarding virtue and industry according to their degrees of merit; but the right of judging and deciding, in disputed cases, is transferred to the Supreme Consistory of Berne, composed of civil and ecclesiastical judges, who determine without appeal. Besides this establishment, the effects of which have been found, for more than two centuries, so essentially beneficial to the republic (as no government can be deemed happy, bereft of religion and morality,—a truth which they appear perfectly to understand), there has been another institution appointed, which does equal honour to its promoters, and perhaps merits the attention of the statesmen of much larger domains:—this has for its object the care of securing the republic from scarcity or famine, which, without so essential a precaution, might be found inevitable; for the whole territory does not exceed eight leagues, or twenty-four English square miles, and its population amounts to forty thousand souls; so that its produce scarcely supplies the inhabitants through the year.

By this establishment, called *la Chambre des Bleds*, or *Public Committee of Corn*, the government has judiciously provided for the first and most important want of life. In consideration of having received a certain sum of the senate, at the original institution of this establishment in 1628, besides six thousand sacks of corn by way of beginning, and the power to contract a loan, on moderate interest, to enable them to purchase the remaining quantity, its commissioners or superintendent officers were obliged to keep a continual supply in the public granary, of about seventy thousand

sacks of corn, to prevent monopoly, and fifty thousand francs, or nearly two hundred and eight pounds sterling, to supply the city in case of emergency.

Their business consists in disposing of the flour to the bakers, and to individuals, at a moderate, but fixed price, and of the best quality; and the commissioners have it not in their power to raise or increase the price without the consent of one of the syndics.

A distinguished care on the part of the government, combined with a well-digested system of laws, operated as a great blessing to the Genevese, who may be considered as making one large family. No people in the world appeared to have so much in their possession,—“enjoying,” as Dr. Moore justly observes, “freedom without licentiousness, and security unbought by the horrors of war.”

Thus did they remain a length of time, in spite of the internal disagreements which now and then occurred, and which may be compared to the bickerings that sometimes happen in families, among the younger and elder branches; and if they had retained sufficient fortitude to preserve that original simplicity of manners and amiableness of character, which had so deservedly attracted the admiration of their neighbours, and strangers in general, their happiness might have been permanent. But, alas! that very industry and activity, which had for ages strengthened them against their enemies, unfortunately accelerated their fall; for, in proportion as Geneva became rich and opulent, avarice and selfishness rapidly increased,—circumstances which induced a well-known modern writer (the chevalier de Bouffler), justly esteemed for the beauty of his poetry, to observe, in his *Tour to Switzerland*—“That the Genevese were in no want of money, and much less of knowledge and information,—but that they were ignorant of the manner of using either for their own happiness: that the women were handsome, but *ennuyées à la mort*, or *wearied to death*, though they richly deserved to be amused:”—In fine, he concludes by comparing the French and the Swiss to a couple of gardeners, one of whom amuses himself in the cultivation of flowers, and the other of cabbages. Certain it is, that during my last residence in that city, the general topic of conversation seemed to be totally engrossed by the *emprunt*, or loan on the *trente-têtes* and *douze-têtes*, being a kind of tontine raised at Paris, as likewise insurances, &c.—transactions which are known to have gone far towards hastening the ruin of France, and of the individuals who had unfortunately allowed themselves thus to speculate. Even amiable young women, who, from their youth and beauty, might have been supposed

more conversant with the sentiments of the heart than with the principles of interest, were led on by example, and made it their favourite topic, eagerly allotting to that purpose whatever spare money they could accumulate, instead of employing it in many respects more appropriate to their sex and youth.

In fact, the desire of becoming rich so universally prevailed, at that time, through every rank and class of people at Geneva, as to give them more the appearance of speculators, jobbers, and money-lenders, vying with each other who should amass the most, than as humble inhabitants of the Alps, and peaceable allies of the Swiss.

If Geneva, from the above picture, be considered at that period as declining from that zenith of virtue and glory she had so justly acquired, it must, however, be acknowledged that her opulence and refined luxury had been retained, her commerce being then at its highest pinnacle of prosperity,—every thing denoting an active and busy scene, more like a maritime town than one above four hundred English miles distant from the sea. At St. Gervais in particular, a part of the city on the right bank of the Rhône, the whole business of Europe, in watch-making, seemed to be centered; while at the Morland, and the Rues-basses, articles of trade were exhibited on so large a scale, as to create the greatest surprise in all strangers,—and, what with the immense number of loaded and unloaded barges continually in the harbour, the huge bales, cases, and casks, disposed about the quays, added to the busy appearance displayed by the people in their various departments, emotions of wonder were powerfully excited.

But at the Paquis and Eaux-vives, situate at the north-east of the town, travelers who have either seen Lyons or Zurich may, for the moment, suppose themselves transported to one of those places, from the extreme number of manufactories in different branches, the extent of their bleaching-grounds, &c. &c.—in short, the activity in every part of the city at that time was so considerable, as to make its population, then estimated at about twenty-four thousand souls, appear to exceed one hundred thousand.

By these means the inhabitants of this little republic were enabled to procure not only articles of absolute necessity (which the contracted limits of their territory could not furnish), but even every desirable comfort. The greatest part of the poorer class of citizens had sufficient at the end of the week, after providing for themselves and families, to allow them the enjoyment of humble recreations.

The taste for rural amusements among the Genevese is such, that after public worship on the Sunday, the city becomes, as it were, deserted, the major part of the inhabitants

engaging in various excursions,—some forming parties on the lake, in the manner before described; others, in parties in carriages, or on horseback, visiting the neighbouring villages; while others take provisions with them, or else depend on the adjacent cottagers for their repast, who receive them with a politeness and civility which could not fail to meet with its reward from the charitable disposition of the Genevese.

One of my greatest enjoyments, during my stay at Sécheron, was, on those days, to witness the happiness, good-humour, and gaiety, which seemed diffused among those industrious republicans, when returning in groups in the evening, meeting, as it were, all at once, for fear of being too late for the shutting of the city-gates, although kept open one hour later on the Sunday. What with the lively, comfortable, and cleanly appearance and decent deportment of the lower class of citizens, and the taste exhibited by those of higher rank, the *coup-d'œil* was delightful, and could not fail of offering to the sentimental traveler abundant matter for pleasing reflexion.

It is certain that Geneva was at this period one of the first commercial places in Switzerland, both on account of the flourishing state of its manufactures and advantageous situation, as before noticed, inclosed between three states, and in every respect a most convenient *dépôt* for merchandises, &c. besides the easy manner of conveyance by means of the lake, the city standing as it does at its extremity.

The temperature of the air of Geneva is in general more cold than hot, though lying in lat. $46^{\circ} 13'$, long. $6^{\circ} 15'$. This circumstance is easily accounted for, from its proximity to the glaciers, and the direction of its lake, which, by tending nearly from S.S.W. to N.N.E. often occasions cold northerly winds; yet is the air pure and wholesome, and the seasons sufficiently marked from each other. The produce of the garden, both in fruits and vegetables, is excellent. Bread is likewise good, and their meat remarkably fine. The market is amply supplied with every article of consumption, and regularly with fish from the lake, three times a week, by people from Savoy and the Pays-de-Vaud. It is no ways uncommon to purchase delicious trout of fifteen or twenty pounds weight, and perch of five or six. The quantity of wine made in the states of the republic is trifling, and what they do make is of inferior quality; but this article is generally procured from Savoy, the Maconnais, and the Pays-de-Vaud, where it is excellent, and whence, from their nearness of situation, they can obtain it at a moderate rate.

There were formerly at Geneva some sumptuary laws, as there are still at Berne and the other Swiss cantons. These were extremely strict, and went so far as to

restrain the inhabitants from keeping more than a certain number of domestics, horses, and carriages. The same laws extended to their dress, and manner of living in times of scarcity. But such prudent regulations, as well as others tending to similar purposes, which had for a length of time preserved their morals, by restraining them from superfluities, or, in other words, luxury, have now fallen into disuse, and been so totally neglected, that there was no more resemblance in 1788 between a Genevese of that time, and one at the commencement of the present century, than between an Athenian and a Lacedæmonian.

I am, however, ready to acknowledge, that several causes may have concurred towards effecting so sudden a change, both in their character, morals, and manners; though, without wishing or indeed endeavouring to enumerate them, I shall confine myself simply to those to which, in my opinion, that change may chiefly be attributed:—1st, To the introduction of foreign troops into the garrison in 1782. 2dly, To the erection of a theatre. 3dly, To the establishing of coffee-houses, when clubs were abolished: And, lastly, to the great number of foreigners, who rapidly succeeded each other, and who, from making Geneva and its environs their residence, have introduced a taste for luxury and fashion heretofore unknown among the Genevese.

I must not omit observing, that though, even previous to the French revolution, the money of France was chiefly the current coin at Geneva, yet this little republic coins its own money in gold, silver, and copper. Its arms are—*d'or, au demi-aigle de sable, parti de gueules à la clef d'argent*. The silver key in the escutcheon was the gift of pope Pius the Second, about the middle of the 5th century; and the eagle, that of the emperor Rodolphus the First, in the 13th, considering it as an imperial city, or belonging to the empire. Its motto or device has ever since the Reformation been

POST TENEBRAS LUX*.

John Owen, the old Welch bard, known by his sarcastical epigrams and *bons-mots*, passing through Geneva in 1612, made the four following lines on their arms:

Clavem aquilamque gerit, duplex insigne, Geneva:

Illud Papatûs; hoc habet Imperii.

Hoc insigne tuum quo jure, Geneva, tenebis,

Si repetat clavem Roma, Rodolphus avem?

The same poet, likewise, deeming their laws too severe against adultery—that crime being punished with death—he composed an epigram on the subject:

* After darkness, light.

MINISTER GENEVENSIS.

Vis et adulterium plectatur morte, minister?

Haud mirum!—Conjux est tibi bella;—sapis*.

As for the fortifications and outworks of Geneva, they are mostly modern, consisting of bastions, half-moons, covert-way, &c. Those which defend the side towards Savoy are in good condition, and are in a manner new, having only been completed about thirty years ago. They are lined or faced with free-stone, as is likewise the counter-scarp of the advanced works. The fossés, or ditches, are of a good proportion, and mostly filled with water. The galleries of the mines are excellent, and extend considerably beyond the glacis; but, as the neighbouring ground is uneven, some parts of the works are overlooked; so that the place, in case of siege, would be liable to suffer materially by the *ricochet* firing.

The *terres-plains* of the courtines and bastions being nearly every-where shaded by trees, they afford a delightful promenade, which is much frequented by the inhabitants. In the front of these works is an extensive esplanade, or parade, called *Plain-Palais*, where the Genevese militia regularly performed their evolutions before the disarmament in 1782. It was likewise a spot appropriated to the celebration of national *fêtes* and public rejoicings.

But the fortifications towards the French frontier are in a miserable state, the inhabitants having positively objected to their being either rebuilt or repaired, both on account of the expense, and for some political reasons.

This part of the city, which is called St. Gervais, though so badly defended, is not so ancient as that of St. Pierre, from which it is separated only by the small island before noticed, of about three hundred paces long, and one hundred wide, formed by the two branches of the Rhône.

On the side of the lake the town is defended by several large piles of wood, fixed at proper distances from each other, so as to prevent boats from entering the port. These piles, or more properly piers, are fastened together by *madriers*, or huge pieces of timber, placed upon them, and thus forming the harbour, the entrance of which is shut every night by means of a chain, in the manner of that of Marseilles. (*Vide* the author's Select Views in the South of France, page 17.)

* Genevese minister—thou would'st punish adultery with death?—I do not wonder at it!—Thou art in the right; for thy wife is beautiful.

The city of Geneva being mostly built on the summit, the sides, and the bottom of two hills, the streets are extremely irregular, though of tolerable width. Those which are most frequented are the *rues basses*, or lower streets, from their running along the banks of the Rhône, and which, on account of being sheltered from the inclemency of the weather by the projecting roofs of the houses, that nearly cover the streets, form a kind of piazza, rendering them so convenient and pleasant, as to be the favourite rendez-vous and promenade of the generality of foreigners who visit Geneva; besides, most of the capital bankers and merchants reside in that quarter: the houses are likewise well built, lofty, and handsome, many of them being ornamented with different orders of architecture.

Respecting their public edifices, the cathedral of St. Pierre very well deserves the attention of the curious. Its external appearance is both noble and majestic. The pediment of its portico is supported by white marble columns of the Corinthian order, and the interior part of the building contains curious inscriptions and monuments, remarkable for design and execution. This edifice not only serves for divine worship, which is regularly performed every Sunday, but is likewise appropriated for holding the general meeting of the *bourgeois*, at the election of the syndics, and other similar assemblies. The *Hôpital Général*, or Public Hospital, should not be overlooked, as it does infinite honour to the humanity and opulence of the Genevese, both from its extent and the judicious arrangement of the apartments for the sick, as well as the excellent and well-regulated administration through every department. The *Maison-de-Ville*, or Town-Hall, is a handsome building, though very ancient: its grand stair-case is particularly curious, from its construction, having been erected with so easy an ascent, that either horse or carriage might ascend or descend with the greatest ease and safety.

The favourite walk, to which the *beau-monde* of Geneva resort after the gates are shut, is at the back of this building. The first time I entered the walk, which is called *La Treille*, I was astonished at the number of bewitching countenances I met there; for, in truth, every beholder must allow that the women of Geneva are in general extremely pretty, and display their charms to the greatest advantage. The men are not so handsome; but, to make up the deficiency, they have a pleasing manner, with some degree of facetiousness, though rather cool and reserved, or at least not so volatile as the French; but, as the philosopher Jean Jaques Rousseau observes in a letter to his friend D'Alembert, "Beneath that cold phlegmatic appearance, the Genevese conceals

a soul filled with ardour and sensibility, easier to be affected than restrained,"—a truth which has been but too strongly evinced by the recent troubles and commotions which have desolated this city.

But the object which merits the greatest attention from foreigners is their Public Library, which is truly a literary treasure, containing a large and valuable collection of books and manuscripts. The order and regularity with which it is kept is highly meritorious to the person entrusted with its direction; and as, by the principle of the constitution of this little republic, its inhabitants, since the Reformation, have considered themselves as one and the same family, every individual has a right to visit or frequent the Public Library, with full liberty to consult whatever books he pleases,—with permission, under certain restrictions, to take them home, the better to facilitate and encourage the propagation of knowledge.

It is likewise necessary for strangers to see the *Collège Public*, or University, which is amply supplied with professors in philosophy and the *belles-lettres*, and stands nearly contiguous to the former. The professors, being paid by the senate, the university is rendered perfectly free to either citizen or *natif*, who indiscriminately send their children thither to be educated.

Besides the public library, there are several private ones, replete with excellent works from the first writers in Europe, in their own languages, where strangers and others may procure admission and books for a trifling subscription.

The naturalist and amateur in painting will find in this city several valuable collections in their different branches of study.

Having given a general idea of the principal facts relating to the history and government of Geneva, including the most interesting objects within its walls, it only remains to lay before my reader the observations I have had an opportunity of making relative to the natural history of its environs, beginning, in the first place, with the lake.

Lake Lemman, otherwise the Lake of Geneva, doubtless derives its original appellation from the Celtic, *Leman* signifying *lake*, or *vast surface of water*. Cæsar, likewise, in his Commentaries, and Strabo and Ptolemy, in their works, call it *Lacus Lemanus*. Its form or figure may be said to describe a kind of crescent, having its convexity nearly turned toward the north, and its concavity (which is not so much curved, though more irregular) toward the south. Its eastern point or extremity is also more obtuse

than the western, which stretches nearer the south than the former, having likewise a direction nearly parallel to the Jura, in an extent of about one third of its length, which, if taken on the side of the Pays-de-Vaud, from Geneva to Villeneuve, its two extremities, or from east to west by north, is supposed to be eighteen leagues three quarters by Monsieur Fatio's measurement, and sixty-one English miles and a half by my own. The same mathematician considers the interior banks of the crescent next to Chablais, from east to west by south, to be fifteen leagues, or forty-five English miles; and, according to Messieurs Pictet and Mallet's calculations, its greatest width, from Rolle to Thonon, three leagues and a quarter, or about ten English miles.

But as to its very great depth naturalists have differed, some having supposed it to reach one thousand nine hundred feet,—a supposition which to me appears doubtful, not having found it, by various and repeated soundings, in different parts of the lake, to exceed one thousand three hundred.

By the several ingenious and curious experiments made by Monsieur de Saussure, to determine the temperature of the water, it has been found, that, at the exact depth of nine hundred and fifty French feet, or one thousand and twelve and a half English, it was four degrees three tenths above the freezing point according to Réaumur's thermometer, and four degrees and a half on the surface, the thermometer being exposed to the air, marking two degrees and a quarter.

Another scientific writer (Monsieur de Luc) has estimated the height of the surface of the lake one hundred and eighty-seven toises, or one thousand one hundred and ninety-five and three quarters English feet above the level of the sea,—its water, at the time of its measurement, being at its greatest height, owing to a periodical swell, which it is annually subject to. The poet Lucan thus mentions it in his *Pharsalia*—“*Deseruere cavo tentoria fixa Lemano.*”—The Lake Lemman, or of Geneva, may be considered as an immense hollow, or sunken valley, which, from its situation at the foot of the Pennine Alps, becomes, as it were, a reservoir or receptacle for the waters which precipitate themselves in such torrents from that tremendous chain, at the melting of the snow, as to occasion a rise of upwards of six feet in the months of June, July, and August; and which, from the circumstance of its scarcely ever raining on the high Alps during the winter season, decreases as considerably in January, February, and March.

Besides this periodical fluctuation, its waters experience a kind of flux and reflux, called *seiches* by the people of the country. This phenomenon, which generally occurs

during tempestuous weather, has been known to take place even in a calm; but the circumstance is singular. The waters, at those times, are seen to rise rapidly to the height of about five feet, and to fall as suddenly, and thus successively for several hours; while a rumbling noise is heard, not unlike the explosion or firing of distant guns. Many have been the conjectures and suppositions of the Genevese naturalists to account for this phenomenon, which is no-where so conspicuous as near the extremities of the lake. By some of those eminent men it has been ascribed to the effects of a sudden shock of the wind; by others to the *refoulement*, or ebbing of the river Arve; while, again, others have attributed it to the action of electrical clouds, which, when passing over the lake, have by attraction raised the waters to the height above mentioned, and so produced that kind of undulation. Now, as I do not exactly acquiesce in those ideas, I shall here beg leave to state my own suppositions, having had frequent opportunities of witnessing the effects of those *seiches*, and, like others, been tempted to search into their cause.

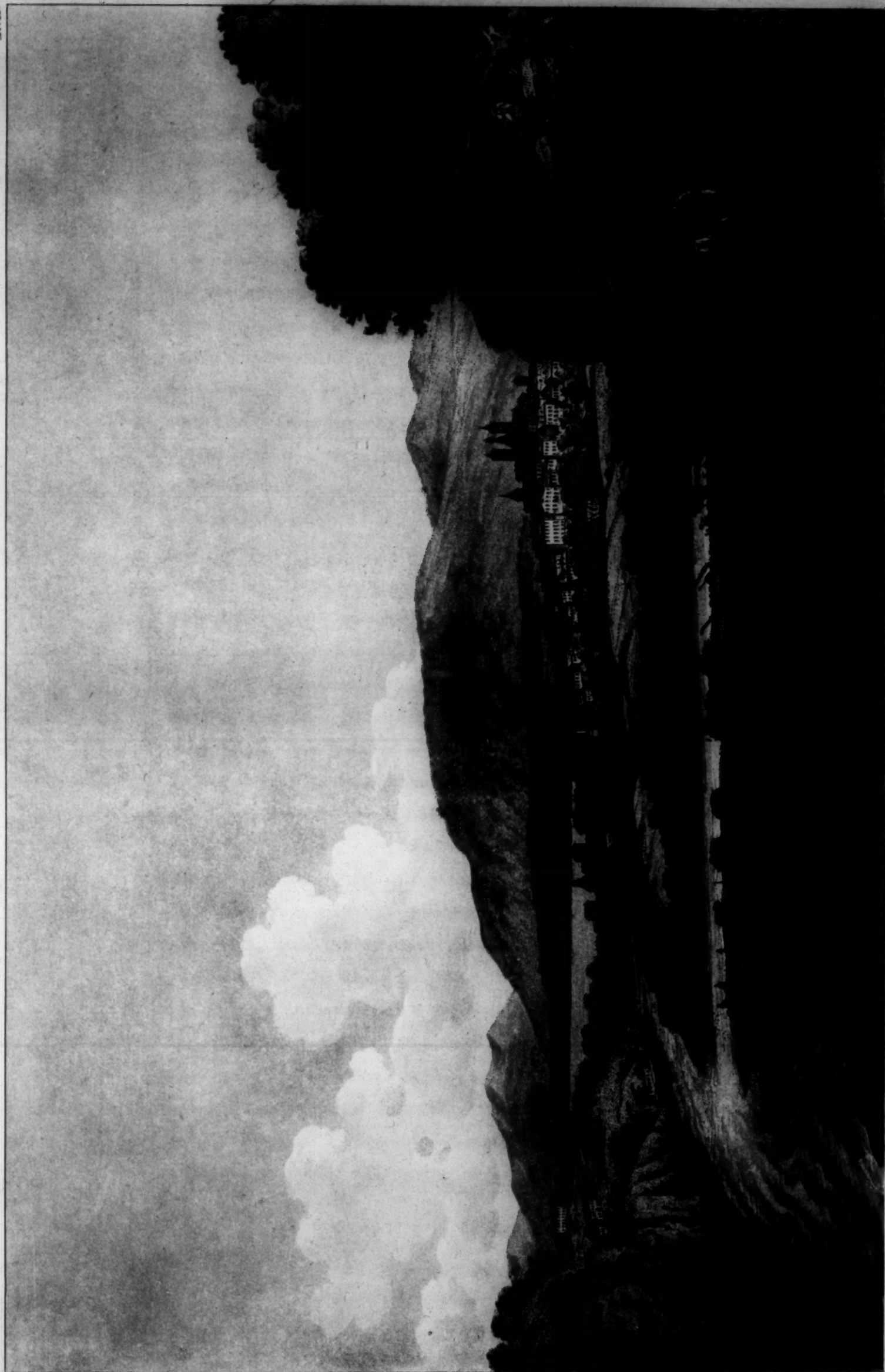
From what I have observed, I have been induced strongly to suspect that this singular effect may in some degree be ascribed to the currents which exist at the bottom of the lake, independent of those of the rivers which throw themselves into it; as likewise to the subterraneous air, called *vandaise* by the Genevese watermen,—which, by rising to the surface of the lake, so frequently occasions storms; besides many other causes, which I may in future endeavour to explain.

Water spouts have also been observed to have risen on the lake to one hundred and thirty toises above the surface of the water, in the shape of a funnel, extending thirty-five toises in diameter, though happening at all times invariably where the depth of water is the greatest, or between Meillerie, Lausanne, and Vevay.

These phenomena do not often happen; but, when they do, ought assuredly to be reckoned as curious as those which are now and then observable on the ocean.

The lake, in the environs of Geneva, as before mentioned, decreases both in width and depth; and a quarter of a league from the harbour, or Cape Sécheron, to the hills of Cologny, is crossed by a bank of argillaceous earth of tolerable thickness, at all times covered by the water, though from seven to eight feet higher, and in some places more, than the common or original bed of the lake. The abrupt state of its declivity, and the chamfreteed appearance of its border or edge, give it the exact resemblance of a fissure experienced in that particular part; whereas, contiguous to Geneva, it is





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evident that the bed of the lake has retained its original height, a supposition no ways improbable.

On this bank, called *Le Travers*, which is in great part covered with sand and pebbles, stands, near the Pagnis, a huge granitic stone, universally known to the Genevese by the appellation of *Pierre-à-Nitton*, being a corruption of the word *Neptune*;—it being a received opinion among them that on this stone originally stood an altar dedicated to that god.

This block of granite, as well as many others of similar kind, found on the hills which screen the basis of the Jura, the Vouaches, and the Salève, to an elevation of five hundred feet at least, merit attention, and must be deemed curious, being visibly foreign to the places where they now stand, and cannot possibly have come from any part, except the highest primordial peaks of the Alps. Similar pieces have I likewise remarked, as well as lamellated hornstone and primitive rock, in several places on the banks of the lake, and on the road from Geneva to Evian. Now, as to the manner in which they may have been conveyed to those places, the force which has acted on them, or rather by what convulsion or operation of Nature they may have been thrown there, are questions difficult to resolve; yet I shall hereafter venture to hazard my opinion on this subject.

But to return to Geneva.—Considering this city as seated at the extremity of this noble lake, and on the declivity of two hills, separated only by the course of the Rhône, which, on breaking out of the lake, flows through the city nearly from east to west, in a smooth, deep, and transparent stream, it may be said not only to command one of the most pleasing and well-cultivated countries it is possible to conceive, but in fact to become, from whatever point it is viewed, an interesting object. (*Vide N° XIII.*)

Contiguous to a deep ravine, near the hills Labatie and St. Jean, at the eastern part of the city, the polluted Arve, which takes its source among the glaciers of Fancignie, mingles, with great rapidity, its muddy waters with those of the Rhône. The swelling of this river, at the melting of the snow, becomes so considerable, that it overflows its banks, and inundates the surrounding fields and gardens. Its impetuosity is then so rapid, that, not finding scope proportionate to its bulk and velocity in the deep narrow channel dug by its water, in conjunction with that of the Rhône, it has frequently been known to cause a retrograde motion in the latter, forcing it to return again into the lake. Even when I was last at Geneva, several people recollected the mills working

by a contrary motion from the above circumstance; though the 14th of September, 1733, is supposed to have been the last time this singular event was noticed. Since that time, the Rhône, although now and then impeded, or in some degree stopped, by the velocity of the Arve, has not been observed to retrograde.

St. Jean's Hill, on which is built that part of the town denominated St. Gervais, as also the one on which stands St. Pierre, which is a continuation of those of Coligny, as well as Labatie, on the left of the Arve, including those along the banks of the Rhône in the neighbourhood of Geneva,—all these, in general, gradually rise towards the high calcareous mountains which screen the great valley of Lake Lemán, and appear to show, by their respective height, the original elevation which the bed of the lake had, in all probability, when the water, according to every appearance, extended from the Salève to the Jura, but was restrained on the south-west side by the Vouaches and Mount Sion, mountains situated between the two former.

Admitting this hypothesis, may we not be led to suppose, that the valleys and ravines which are in the vicinity of Geneva between the above-mentioned hills, which serve as a bed to the Rhône and the Arve, have likewise been the work of some great and rapid current, which probably existed at the time when a sudden or violent convulsion of Nature affected the Jura contiguous to the defile of Cluse? This, likewise, by severing that mountain, not only formed the Vouaches, but at once opened the defile into which the waters of the lake precipitated, and, in process of time, furrowed by their extreme impetuosity, in a direction analogous to their course, the bottom of the channel, stretching out at first, and afterwards imperceptibly finishing, at their last retreat, the hills and ravines such as they now appear, which are still gradually decreasing, as is evident by the various observations made on the spot by men of the greatest abilities. Among these, monsieur Senebier, librarian to the republic, well known for his extensive knowledge, gives it as his opinion, that for eight or ten centuries the waters of the lake have insensibly decreased.

By way of corroborating the preceding ideas, historical and geological proofs may be brought to show, that the Rues-basses, Plein Palais, Carrouge, and Près l'Evêque, were originally submerged by the waters of the lake. In the first place, the great analogy that exists between the beds or strata of the Jura and those of the Vouaches, both as to structure, direction, and composition. 2dly, The direction of the hills, which are all nearly parallel to the Jura and Salève, inclining, with little variation, towards the defile

of Cluse. 3dly, The composition or structure of the same hills, the strata of which are almost invariably parallel to the horizon, corresponding both as to matter and thickness; which are all, as I have before noticed, formed of sand, pebbles, argillaceous earth, a species of pudding-stone incrustated in a calcareous cement, and a soft kind of sandstone, or *mollasse*, which hardens in the air, but without fossils; although, in the calcareous mountains that screen the extremity of the lake, vast quantities of different species are found imbedded. 4thly, The structure and form of Mount Sion (a mountain situate between the Vouaches and Salève). This is formed of sand, pebbles, and sandstone,—a proof that it has served, at some remote period, as a boundary to the lake at its southern extremity, which, from every appearance, has even been likewise anciently submerged. This conjecture, likewise, may probably not appear entirely unfounded, to persons who have carefully bestowed some attention on the structure of the Salève, whose direction tends nearly from north-east to south-west, about a mile and a half distant from Geneva; but whose abrupt sides, towards the city, exhibit large naked strata, torn and chamfreteed almost horizontally. This circumstance seems to have been effected by the different currents that existed in that part of the Alps, when the sea universally prevailed over the secondary mountains.

Having thus far concluded my description of Geneva and its surrounding country, I shall now merely subjoin the names of the most curious plants found on the hills contiguous to the city; at the same time acquainting the lovers of ichthyology and ornithology, that both within and without the lake they may meet with objects deserving attention: among which the *colymbus cristatus* of Linnæus is particularly beautiful, and its feathers, of a silvery white, yield a down of great value,—the *colymbus iners*—the *colymbus arcticus*—the *tantulus falcinellus*—the *tringa hypoleucos*,—besides an astonishing variety of wild ducks. As for the botanist, he may soon enrich his collection with a number of curious plants; for the *erythronium dens canis*—the *centaurea solstitialis*—the *anemone renunculoides*—the *cucubalus bacciferus*—the *geranium sanguineum*—the *plantago coronopus*, and many others, too tedious to enumerate, are in vast profusion; most of which are likewise indigenous in the South of France. Nor must I omit, previous to my leaving this charming country, to inform the lithologist, that this spot to him must likewise become a place of peculiar research, on account of the rich and valuable specimens of productions from the Alps, found on the banks of the lake and the beds of the rivers.

ROAD FROM GENEVA TO LAUSANNE.

DURING my stay at Sécheron, my favourite little village, situate on the high road to Germany, Switzerland, and Italy, I had heard such rapturous and pleasing accounts of the celebrated Pays-de-Vaud, and the tremendous height and difficult access of the Great St. Bernard, that, my imagination being elated with the description, I became more than ever determined on surveying the former, and crossing the latter, ere the season should become too advanced for the undertaking. For this purpose, I set off on the 22d of June, and rode the whole way upon mules,—those creatures being reckoned by far the safest and most to be depended on in rugged paths and difficult ascents and descents. Their sagacity is such, that they may commonly be left very much to themselves, having been invariably found to fix on the way that has the least danger.

This journey, which took me up about five or six and thirty days, I rank among the many, made before and since in different parts of the Alps, on which I can look back with the greatest satisfaction,—it having not only left a pleasing remembrance on my mind, but contributed the most towards improving and confirming my knowledge in lithology. It likewise clearly proved what trifling changes in the direction of those valleys tend to modify the temperature of the atmosphere, considering the great disparity and extreme variety of objects which, during this excursion, successively offered themselves to my view; for, as the road I had to pursue ran through a fine and fertile country, composed of beautiful hills, with intervening fields and meadows, the diversity of scenery was charming; and while the luxuriant vine, bending beneath the weight of the juicy grape, often hung in festoons extending to the very edge of the lake, covered with verdure and the bright tints of aquatic flowers, rich fields of corn, whose golden ears were then falling under the reaper's hands, and smiling meadows, enameled with aromatic herbs, filled with cattle sporting on the grass, were intermixed in various parts, and, at no great distance, stupendous mountains, their sides covered with extensive forests of larch and pine, reared their frozen summits, which, though seemingly

resting on the clouds, were still reflected in the pellucid waters of Lake Lemman, and served to form one of the most variegated and majestic landscapes that ever delighted the eye.

Soon after I had quitted Sécheron, I perceived the column, or stone, which marks the Genevese boundary; and by the arms of Berne, placed on its back, found I was entering that canton,—consequently in the Pays-de-Vaud. The high road, which in that part continues along the basis of Chambésy, one of the hills that screen the lake, and along the windings or sinuosities of its banks, is very beautiful, being most agreeably shaded on both sides by large trees, whose spreading branches meet together, and, with their thick foliage, form a delightful grove.

This hill is of similar structure or composition with that of St. Jean (although its sand-stone, or *mollasse*, used for building, is esteemed superior in quality, being much harder than that found near the Rhône), and is one of those covered with vines, which extend to the edge of the road, intersected at intervals by rich meadows and beautiful villas, belonging to the most wealthy inhabitants of Geneva. As I still pursued the same road, traveling along the banks of the lake, I here and there observed strata of a similar kind of *mollasse*, appearing to shoot out of the earth horizontally, and extend beneath the waters of the lake, a circumstance which led me to infer, that the same strata may likewise stretch to the opposite side, or, in other words, hide or conceal the roots of the nucleus of the Jura;—but as those hills, the chain of which may be considered to extend nearly as far as Lausanne, are mostly of similar composition, I shall confine myself to the following observations;—viz. that, wherever the banks of the lake are more elevated and abrupt, there have I invariably observed the same kind of sand-stone, with similar direction and hardness; that in many places they are covered by wide strata of pebbles, or a thin lamellated clay; and in others, by a species of pudding-stone of little or no consistency, but of which the cement makes an effervescence with acids, although almost every-where again covered by a thick stratum of sand and vegetable earth.

At three miles only from Geneva I quitted the states of Berne, and re-entered those of the republic; so intimately, on that part of the continent, are the Swiss, Genevese, and French territories intermixed; for the village of Genton, through which I passed, as well as that of Maligni, situated more towards the north, belonged originally to the French, and were not ceded to the Genevese till the year 1749. From the former,



№24.



which is most enchantingly seated on the summit of a hill, the basis of which is washed by the lake, the view of the surrounding country, taking in the mountains of Chablais, the Glaciers, and the Lake, is superb; besides the advantage of having been the favourite residence of the virtuous Bonnet, whose loss the sciences have to deplore, but of whom the remembrance must be ever dear to the naturalist, philosopher, and philanthropist: he was a man who possessed all the virtues of humanity, with few of its defects. At no great distance from the same village, though rather more towards the right, and nearer to the lake, stands another beautiful villa, delightfully seated on its banks, the residence of monsieur de Saussure, a relative of the former, and a man who may, with great justice, be pronounced a valuable member of the republic of letters.

From thence I proceeded about a mile and a half further, previous to my entering the French territory, and then crossed Versoix, or *Villa Santinialis*, a village pleasantly situated at the extremity of a noble basin, or creek, formed by the lake. See drawing N° 14, which gives an idea both of that village and the ruins of the town and harbour, begun by order of the French government, under the auspices of the comte de Vergennes, then minister to Lewis the Sixteenth, and monsieur de Voltaire, who were the patrons and supporters of a scheme for making those places serve as a magazine for the merchandises exported or imported in or out of the French dominions. This project, whose original motive was, in fact, only to take advantage of the dissensions which at that time agitated the republic of Geneva, and thus to have erected a commercial city on the ruins of the former, did not however succeed; for the Swiss, jealous of their privileges on the lake, were not the least active in opposing the undertaking; and it was soon after totally abandoned, owing to a reconciliation taking place between the contending parties in the republic, and to the death of the two great men who were at the head of the enterprise. On this event the buildings were suspended, and left to moulder into ruins;—a circumstance which, added to the mean and wretched appearance of the village, wedged as it were in the Swiss territories, offers a woful contrast to the happiness and prosperity displayed through every part of the cantons. In the latter, neither beggars nor idlers are seen in either streets or roads, although the states do not, I am convinced, pay even the hundredth part of what is given to the poor in England (judging comparatively as to the extent of country), where they are, unfortunately, so numerous.

Yet the reason appears simple enough; and this difference may, in some measure, be accounted for, from the manner in which relief is there administered. The indigent, or those whom misfortunes have reduced to a state of beggary, are in most parts of Switzerland assisted by order of the government, or the respective parishes where they reside, at their own dwellings, when their case is properly considered, and care taken that the succours sent shall be judiciously shared by themselves and families, should they have any. Were they found afterwards in the act of begging, they would be taken up as vagrants, and punished. Besides, the Swiss inhabitants, paying little or no taxes, each individual may be said to be the complete proprietor of what he possesses, and consequently better able to assist his neighbour.

Previously, however, to my quitting Versoix, which is in the French territory, to re-enter that of Berne, and of course to continue a description of the Pays-de-Vaud, the most considerable province of that state, I shall here offer some few remarks on its origin, history, government, and the manner in which it has passed to its present possessors or sovereigns.

After the conquest of the Helvetii by the Romans, the Pays-de-Vaud made part of a province at that time called *Maxima Sequanorum*; and, by some historians, supposed to have been the *Pagus Urbigenus* of Julius Cæsar, of which the city of *Orbe*, or *Urba*, still retains the name.

This fine and fruitful country, originally bounded on the west and north-east by the Jura and Pays-de-Gex; on the east, by the canton of Freyburg and the Vallais; on the north, by a part of the lake of Neufchatel and Morat; and, on the south, by the lake of Geneva; is estimated at about sixty-eight miles in length, and sixty in breadth, containing many cities, villages, and hamlets.

In the time of the Romans, who sent hither several colonies, it appears to have been in a flourishing state, as may be conjectured from the numerous specimens of antiquities which have been dug in different places:—of these, the most considerable are in the city of Avanche, or *Aventicum*, where there exist several beautiful remains of an aqueduct, a triumphal arch, pieces of mosaic, and other similar fragments of architecture, which, from the taste, the execution, and the highly-finished manner in which the chapters of the columns and ornaments of the frize are completed, appear evidently to have been the works of the Augustan age. But, at the fall of the Roman empire, this country shared a similar fate to that of Geneva, becoming likewise a part of the

new kingdom of Burgundy, in whose possession it remained till the extinction of that kingdom. It afterwards fell under the German empire, from whence its governors were sent, with supreme authority, to administer justice in its name. The counts, and since dukes, of Zeringhen, were however the first who succeeded in making that title hereditary in their family; for, after the elevation of the first, desirous of raising his family to similar honours, he so nicely managed the good graces of the emperor, that his descendents soon after obtained the right of advowson over the bishops of Geneva, Lausanne, and Sion, who were then very powerful: and it was not till after the extinction of that ancient family, that the counts of Savoy (who already possessed a considerable part of this province), from having likewise won over the nobles to their interest, acquired not only the rights, title, and privileges, heretofore held by the counts or dukes of Zeringhen, but the sovereignty of their house actually acknowledged by the emperors. This is evident from the cession of that country, in 1285, by Amadeus the Fifth, count of Savoy, to his younger brother Lewis, whose lineal descendents held it till 1359, with the title of barony, when it again returned to the elder branch of that illustrious house. At this time Lewis, the then reigning duke, desirous of giving an apanage to his younger children, divided it among them; allotting the comté de Romand, and the northern part of the Pays-de-Vaud, to his son James. But James unfortunately took arms in favour of Charles the Bold, duke of Burgundy, in his bloody and cruel contest against the Swiss, which terminated in the entire defeat of the Burgundians and their ally in 1476 and 1477, in the neighbourhood of Morat and Grandson.

The cantons of Freyburg and Berne, in order to punish James, took possession of his states, and divided them: the remaining part of the barony, which at that epoch still belonged to the reigning branch of Savoy, remained in their possession till 1536; when duke Charles, by his continual attacks on the Genevese territory, forced them to call in the assistance of their allies. The above cantons immediately sent troops, who, by entering the lower part of the Pays-de-Vaud, not only made themselves masters of that country, but of the Pays-de-Gex and the duchy of Chablais, also belonging to the duke of Savoy's dominions, without striking a blow. But, in 1564, these cantons, by the intervention or mediation of the neutral ones, jointly with the courts of France and Spain, obtained the restitution of the two latter; yet not without a renunciation of the former, which was then ceded to Berne and Freyburg for ever; though not properly

the entire sovereignty of it till 1617, by Charles Emmanuel, the then reigning duke of Savoy. It is however evident, that since the restitution of the Pays-de-Gex and the Chablais, the Swiss have neither extended nor diminished their limits.

The Pays-de-Vaud, otherwise called Pays Romand, is now divided into twelve bailliages, or bailiwics, each governed by a bailiff, appointed by the senate or councils of Berne. But as its inhabitants are excluded from holding any employment under the government, according to the laws of the cantons, the dignity which comes nearest that of prefect, or governor, is invariably conferred on natives of Berne, who are generally veterans retired from the service, chosen by ballot, and remain six years in office. They are assisted by the *Cours Baillivales*, or courts for the discussion of feodal causes in the first instance. Those courts, likewise, decide all civil causes of importance by a majority of votes; but the assessors, or judges lateral, have only a deliberative vote in cases of appeal, reserving the sentence to be pronounced by the bailiff. In fact, this office, in the Pays-de-Vaud, is of importance, as the bailiffs are deemed the sub-delegates of the police, and the executors of all sovereign edicts, mandates, &c. &c. The profits of their appointment, at the end of the six years, after all deductions made, are computed to be from twenty-five to thirty thousand crowns, or about four thousand pounds sterling.

The twelve bailiwics, into which the whole province is now divided, are Lausanne, Yverdun, Moudon, Avenche, Vevay, Morges, Nyon, Payerne, Romain Motier, Beaumont or Bon-mont, Oron, and Aubonne. The particular superintendence of these bailiwics is confided to the senate of Berne, who appoint a magistrate for the Pays-de-Vaud, with the title of *Trésorier du Pays Français*, or *Romand*, on account of their language being French.

As to the population, it seems perfectly to correspond with the fertility of the country, and by some is computed at 160,000 souls; and, considering the great number of cities, villages, and hamlets, profusely dispersed all over the province, the above calculation cannot be much over-rated. Its military establishment, like that of the other cantons, is composed of its own militia, consisting of seven regiments of infantry and two companies of cuirassiers, who take the appellation of the principal towns of the country, and are commanded by a land-major, or major of that particular province, a lieutenant-colonel, and a captain; all three appointed by the great council of Berne.

Every officer and soldier is required to furnish his own military accoutrements, and even horses, if belonging to the cavalry; which last is generally formed of the most opulent peasants of the Pays-de-Vaud: they receive no pay, unless on actual service; are required to keep their arms always in proper order; and on Sundays, after divine service, go through their military exercise. In the months of March, or May, they are reviewed by the land-major, who is invested with the power of conferring inferior rank on those he may deem deserving advancement, either for their assiduity, attention, soldier-like appearance, or dexterity in military manœuvres. He has likewise a right to exempt from serving those who have passed the age determined by the laws, or who, by any accident, have contracted complaints, as well as fathers of large families, whose daily employment prevents their attending the usual exercise, &c.

Thus, by the wisdom and judicious care of their government, a succession of good husbandmen for the tillage of their land, and of good soldiers for the defence of their country, is incessantly, and we may add almost imperceptibly, forming in every canton.

There are still several ancient families of noblesse in the Pays-de-Vaud; but who, from the laws of the country, are not eligible to fill any public office of consequence, or office in the state, except that of *chatelain*, or chief magistrate of a district, or others nearly similar to that, unless the right of *bourgeoisie* be conferred by the senate or councils of Berne: this, however, seldom happens, the Bernois being extremely jealous of their rights and privileges, and never disposing of that right by purchase, but reserving it solely for the reward of merit, or else for individuals who have shown the strongest attachment to their constitution or government.

As to the character of the inhabitants, they have, in general, all the gaiety, good humour, and even a little of the levity, of the French; in which respect they remarkably differ from the rest of the Swiss, who are naturally cold and phlegmatic, and whose manners are more repulsive.

As they have scarcely any public functions to exercise in their own country, from the exclusion before mentioned, and as the study of the *belles-lettres* may be pursued gratis, the professors being there paid by the state, they devote themselves mostly to literature; which, in a great measure, explains why the number of well-informed French protestant clergymen, dispersed all over Europe, are more from the Pays-de-Vaud than from any other part of Switzerland.

The women are in general tall, well-made, lively, and well informed, great care and attention being paid to their education; which circumstance has induced many of them to quit their country, in order to fix either in England or Holland, as governesses, &c.

From Versoix I proceeded to Copet, seven miles from Geneva, which, although the capital of a barony, has nothing worth attending to, except its château, belonging to M. Necker, formerly minister and general director of the French finances under Lewis the Sixteenth. This charming mansion, which served as the residence of his royal highness the duke of Gloucester, during the summer of 1787, is indeed fit for a prince, from the extensiveness of its apartments, and from the noble and magnificent appearance of it altogether. The road next leads to Nyon, distant about six miles, supposed to have been the *Colonia Equestris Noviodunum* of the Romans, mentioned by Pliny, but at present the residence of a bailiff. In this town and its environs have been found many remnants of antiquity, such as medals, sepulchral urns, fragments of bas-reliefs, &c. From its convenient situation, on the banks of the lake, and at the point of junction of the high roads to Burgundy, Geneva, and Lausanne, it is enriched by commerce, which shows itself in its buildings. The streets are of tolerable width; and its walks, which are particularly rural and picturesque, extremely well kept.

On the side of the town towards Rolle is a manufacture of porcelain, which has, within a few years, acquired much reputation, from the whiteness, clearness, and transparency of the ware itself, as well as the beauty of the colouring or painting.

Strangers, who may have left Geneva without previously visiting the Jura and the Dôle, may still, from Nyon, be able to satisfy their curiosity,—those mountains being only six or seven miles distant; and, though one continued ascent, there is an excellent road the whole way.

This excursion ought to be strongly recommended to strangers in general, and to naturalists in particular; for the delay occasioned by so trifling a deviation from the usual track will be amply repaid by the variety of interesting objects which present themselves on all sides, the inspection of which will prepare the mind for a series of information that would otherwise be lost. It is from the summit of the Dôle only that a proper idea can be formed of the height and direction of the secondary and tertiary mountains which screen the lake, including those which constitute the extensive chain of the Jura, whose roots stretch as far as mount Boetz-berg, called by Tacitus *Vocetius*,

a mountain contiguous to Basle, but which, from the Dôle, gradually diverges towards the north, leaving the lake in an eastern direction.

The figure of the Dôle may be deemed extremely singular, having the appearance of an immense rock, or, if I may be allowed the expression, that of a double mountain, it being precisely placed on the summit of the Jura, from whence, according to my measurement, it is elevated seven hundred feet, and is five thousand seven hundred and seventy-four above the level of the sea. But a circumstance which is still more extraordinary is, that its strata totally differ from those of the Jura, on which it stands, having no apparent analogy in either direction, thickness, or structure. The side of the Dôle next the lake is very abrupt, resembling the great Salève, having likewise a similarity in its strata, which are perfectly parallel to each other, inclining towards the horizon at its two extremities, and lowering considerably on the north-west side. These strata are of a greyish colour, much harder than those of the Jura, containing few fossils, although calcareous, and in many parts covered by another species of calcareous stone of a yellowish hue, similar to what I had before seen in the neighbourhood of Cluse, and on the sides of the Jura, containing, like those, a quantity of exuviae of petrified marine bodies, such as *echinitæ*, *anomiæ*, *corallites*, *tubulariæ*, *versiculiti*, &c. This observation, joined to those I had previously had an opportunity of making near the town of Gex, at the basis of the Jura, on the Vouaches contiguous to Chaumont in Savoy, as also on the Salève, has so far strengthened my former opinion respecting their formation, as in a manner to convince me that the mass of these chains have doubtless been formed at two different periods of time; as also, that the hard parallel calcareous strata, visible in so many places on the same mountains, may be reasonably presumed to be no other than the salient or projecting parts of their nucleus, the date of which appears to be much anterior to the calcareous strata which cover them to their summit. The latter have less density than the former, are coarser-grained, thinner, of a different colour, and have a greater number of fossils, and bear evident marks of having been the effects of the works of the sea, when it yet submerged that part of the Alps, previous to its last transmutation.

Another remark, no less curious, and which seems to corroborate the preceding ideas, is, that the calcareous strata before noticed, which cover the mountains, have a direction quite different from those which form their nucleus, or interior, and which, in various parts, serve them even as supports or props,—being, in general, so inclined, as to

rise considerably towards their summit; but, next to the lake, they lower or decline as remarkably, apparently extending under the water. It is certain that they exhibit different appearances, as to their direction, in various parts of these mountains,—such as convex, concave,—sometimes in the form of an arch or vault, and even doubling or turning over themselves; in short, in a kind of confused and disordered state. From these appearances, there is every reason to suppose that these singular effects may most probably have been the consequences of some violent and sudden convulsion, operating in the bowels of the earth, in that particular chain of the Alps, at a time when the sea still deluged that part of our continent, before its strata had acquired the state of consistency which in general characterises that species of stone, but which it has since again covered by its sediment in its last emersion.

Besides the above singular circumstance in the upper strata of the Dôle, and their extreme contrast with those of the nucleus of the Jura, that mountain contains a number of interesting objects for the amateurs of botany and lithology. The former will observe the *aster Alpinus*, *mespilus chamæmespilus*, *veratrum album*, *orobus luteus*, and the *androsace villosa*, which are there in the highest perfection; as likewise the *leontopodium Alpinum*, the *Saturnum nigrum*, the *betonica alopecuros*, the *melissa officinalis*, the *aconitum napellus*, the *aconitum lycoctonum*, the *potentilla aurea*, the *elinopodium Alpinum* of Dioscorides, the *geranium Alpinum longius-radicatum*, &c. The two last, which flower only in July, are similar to those I had seen on Mount Baldo, near the Lake of Guarda.

Owing to the extreme elevations of the Dôle over the Lakes of Geneva, Roses, Joux, Neufchatel, and Morat (every one situated at the base of the Jura), and its proximity to the primitive chain of the Alps, the prospect from its summit is one of the most noble and varied that imagination can conceive. The view, which plunges on nearly the whole surface of the Lake of Geneva, is most agreeably relieved by the soft harmonious tints reflected on its transparent waters by the multiplicity of objects diffused around, and which, when we take a bird's-eye view of them, exhibit the most enchanting landscape of a country to which Nature has been so singularly bountiful. The hills which screen the lake appear, from its vast height, as a plain surface only, on which an incredible number of meadows, fields, and vineyards, separated by compartments, as in a plantation or pleasure-ground, are seen promiscuously mixed together; while the cities, towns, villages, and hamlets, convey the idea of being built of cards, if I may be allowed the expression, from their extreme, and yet distinct minuteness. I use

this simple comparison, not only by way of giving a just conception of what they really appeared at the time, but of the impression they have left in my recollection. Yet, of all the objects which most forcibly attracted my attention, and served, if possible, to excite more strongly my enthusiastic admiration of the works of the great Author of Nature, to whom the habitable world is not even a point in comparison with the entire extent of his works, was the primordial chain of the Alps. This I could easily discern, in an extent of not less than three hundred miles, describing a kind of circle, which seemed to lower on the right hand and left, as if to exhibit, with greater advantage, the stupendous and formidable Mont-Blanc, which occupies the centre of that immense chain.

The summit of the Dôle has likewise, from a custom which I have not been able to trace to its source, been from time immemorial, and still continues to be, the rendez-vous of young people of both sexes who reside in the environs, and of the shepherds inhabiting the Jura, who meet there, annually, the two first Sundays in August. The latter furnish themselves with all kinds of *laitage*, of milk and cream, prepared in various ways, in a manner peculiar to the country, besides cakes, fruits, &c.; while the holiday-keepers spend these festive seasons in innocent and healthful amusements, such as dancing, leaping, wrestling, and other feats of activity.

Arriving, in one of my former excursions, in that neighbourhood, near the time of one of those annual meetings, I determined on staying a few days longer than I had purposed, to witness a scene which I might never again have a like opportunity of seeing. I therefore requested the person with whom I resided, who was likewise the proprietor of a couple of *chalets**, or dairies, situated at the foot of the abrupt rock which forms a part of the Dôle on the side next the lake, to accompany me; which he obligingly did. No sooner had we reached the summit of the mountain, than, to my utter astonishment, we perceived not less than seven or eight hundred villagers assembled, whose healthy, good-humoured physiognomies, and rustic but cleanly appearance, (for their linen might have rivaled the snow in whiteness) sufficiently evinced happiness and content. Scenes of this description are of importance to travelers, as characteristic features of the country. Where happiness is visible, our estimates ought not to be defective.

* Small huts, built on the mountains, to which, during the summer months, the Swiss send their cattle to graze,—and where they make their cheeses, which are excellent, and much esteemed in the neighbouring countries.

While, in groupes, these happy people were forming their parties, and fixing on their different pursuits, each countenance seemed elated, and peace and harmony prevailed through the whole. As we were walking, with observant eyes, intermingling with the various parties, composing a scene which filled my heart with the most pleasing sensations, I perceived two men and a young woman at some distance, conversing with great animation, and pointing to a particular spot. I immediately hastened to them, fearing that some accident had recently happened. In this I was mistaken. My curiosity, however, having been excited, I, as civilly as I could, requested to be made acquainted with the subject of their observation and discourse. They instantly complied;—then, pointing to a large red spot, easily discernible on that side of the mountain, the elder told me, with strong marks of emotion, that what I saw were the marks of blood; that an unfortunate couple had there perished on their wedding-day, some years back; that, being married on one of the annual meetings, they had purposed, with their friends, to spend that day on the mountain; that, while they were variously engaged, the bride and bridegroom, amusing themselves by walking on the edge of the wide terrace which crowns the Dôle, had, as is too much the custom with the young people of the present day, challenged each other which could venture the nearest to the brink,—on which her foot slipping, and he unable to restrain her, they were both hurried down a precipice seven hundred feet deep, and thus in an instant lost lives which might be said scarcely to have been begun, since the day which to them appeared the first of their most happy existence consigned them to one and the same grave. What a subject for pity and reflexion!

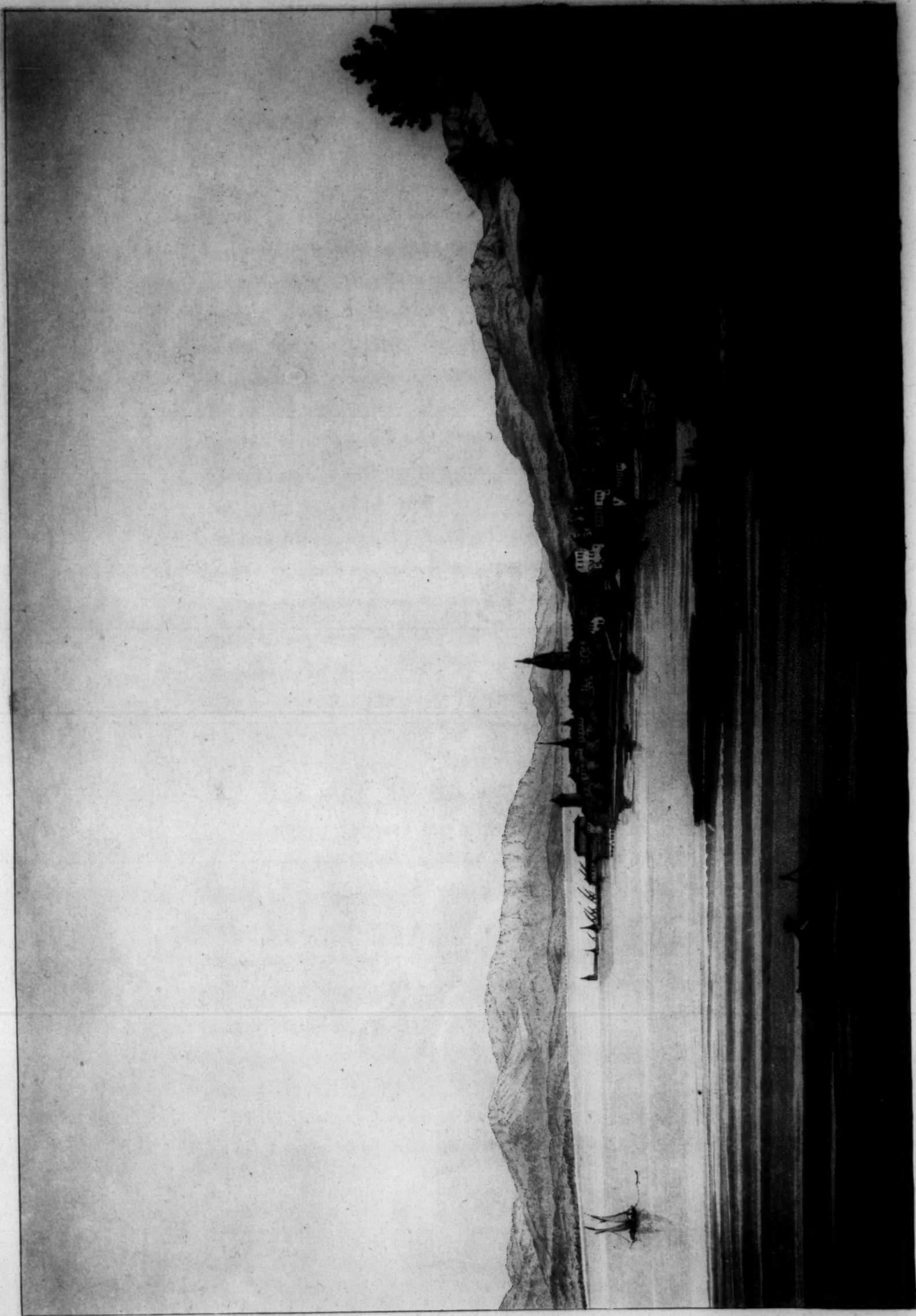
From Nyon, I continued my journey to Rolle, a town which bears the title of a barony, agreeably situated likewise near the lake, and which, from being well built, is much resorted to by strangers, on account of its mineral springs and delightful romantic walks:—this, added to good society, formed of many genteel and opulent families in the neighbourhood, makes it a desirable spot for persons of moderate income; and must, from its situation, and the number of elegant villas scattered about its vicinity, bring to the English traveler's recollection the villa-decorated banks of the Thames. It is likewise noted for the famous hill of *la Côte*, which produces a most excellent and esteemed white wine, in taste very like hock.

This hill, which stretches towards Morges, is entirely covered with vines to an extent of twelve miles, from the river Promontouse to that of Aubonne; so that the





Nº 15.



quantity of wine exported from Rolle and its environs is very considerable, and brings large sums of money into the country. On leaving Rolle, I directed my course nine miles further, to Morges itself, the last town before arriving at Lausanne. The road, the whole way, continues delightful, and forms, if possible, a more picturesque and varied scenery than from Nyon to Rolle, and is rendered extremely beautiful by a variety of charming villas, small villages, and rural hamlets, promiscuously dispersed. In some parts it follows the windings of the lake, and in others the sides or bases of high hills covered with vines, whose branches entwine around those of the huge majestic walnut-trees which line its sides, presenting a pleasing object to the view, and a delightful and refreshing shade.

On the summit of a hill, four miles from Rolle, and three from the high road, stands Aubonne, or Albona, a small town built in the form of an amphitheatre, from which the lake, the mountains of Fancignie, the plains of Chablais, and the fertile hills of the Pays-de-Vaud, are seen to the greatest advantage, forming a most superb and noble view.

In the district of St. Livre, at the foot of the Jura, at no great distance from Aubonne, is likewise an extensive cavern, which stretches far into the interior of the mountain. This merits the traveler's attention, both from the number of beautiful stalactites of various forms and colour, which it contains, and the incessant rumbling noise which is heard, as if proceeding from the heart of the mountain, not unlike the flowing of a river.

I must not here omit mentioning, that on the high road from Rolle to Morges, though more particularly near the village of St. Prex, I in several places observed huge blocks of pudding-stone, similar to those found in the Alps, having the same degree of consistence, and the same kind of cement, as also pieces of granite of less bulk, and others of the compound class,—evidently productions of the primitive chain, though foreign to the soil on which they now stand.

The town of Morges is extremely pleasant, well-built, populous, and carries on some trade, from its situation near the lake (*Vide* N° 15.), as well as being on the high road to Germany, Italy, and Burgundy. It has likewise a commodious and spacious port, built by the senate or government of Berne, capable of admitting one hundred large vessels, besides magazines and warehouses for the reception of goods, &c. There is also a kind of custom-house, where the duties on exports and imports are paid, the produce of which is considerable, and belongs to the state.

The town of Morges is likewise the seat of one of the largest bailiwicks of the Pays-de-Vaud, including within its jurisdiction eighty villages, three small towns, and forty *seigneuries* or manors. Its soil is fertile, producing much corn and wine; and vast quantities of cattle are bred in its neighbourhood:—in fact, I know few towns in Switzerland where the inhabitants appear to enjoy more real happiness and comfort than at Morges, which, with the air of prosperity and neatness that reigns throughout, naturally accounts for its being much frequented by strangers.

I shall here give the description of a fête, which took place on the day I was passing through it in my way to Lausanne, and which detained me some hours longer than I had intended in the town.

Since the annexation of the Pays-de-Vaud to Switzerland, its inhabitants have insensibly adopted the usages and customs of the Helvetic cantons; and, like them, have also formed several companies of archers and carabiniers, who exercise themselves during a certain time of the year, and sometimes on Sundays, after public worship.

The government, sensible of the policy and utility of encouraging such recreations, grant annual prizes to those who excel, and can shoot nearest the mark, so as to carry off, with either arrow or bullet (making use of both), a small wooden bird, placed at the distance of about one hundred and sixty paces in the front of the target. Besides the above prize, which is invariably a sum of money paid out of the treasury, there are other honourable badges, such as titles of merit, or pieces of plate, &c.—gifts conferred by the bailiff, who never fails assisting at the ceremony, as well as the magistrates and most respectable families of the country: so that these meetings are in general numerous, attracting a vast concourse of people. Yet, though this species of amusement be frequent in Switzerland, the capital prizes are never given but on particular days—as on the solemnisation of some great annual festival, which, in the Pays-de-Vaud, is commonly on the 2d of May and 22d of June, in commemoration of the victory won at Morat, &c. over Charles the Bold, duke of Burgundy.

Fortunately, arriving on one of the above-mentioned days at Morges, I had the satisfaction of witnessing a part of this joyful festival. As I drew near the town, I discerned the emblems of rejoicing displayed on every side; and, on entering, met, in the midst of drums beating, bells ringing, banners flying, bearing the arms of the Thirteen Cantons, a procession of the military, archers, and carabiniers, all in their uniform, attended by a band of martial music, proceeding to the Maison-de-Ville to receive their prizes.

This jovial day, as I was informed, was to close with a ball given by the bailiff at the château, and others at the houses of private individuals. In short, never did I before see so military and at the same time so pleasant a sight—every one appearing to possess one and the same idea of rendering each other happy; and assuredly, under so prudent a government, and with such excellent dispositions on the part of the people, it would be astonishing were they not so in reality.

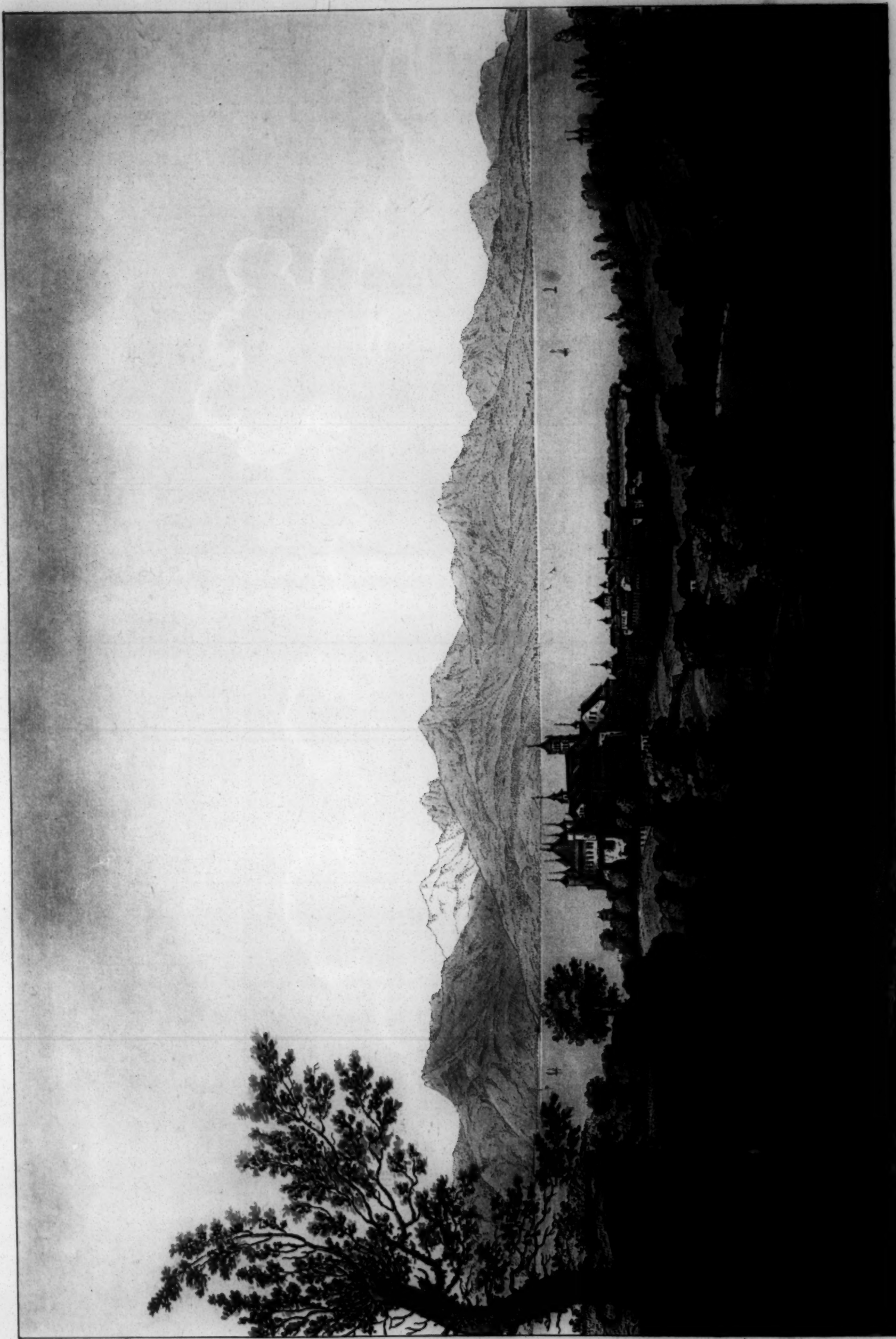
Indeed, so delighted and pleased was I with what I had seen and heard, that gladly would I have stayed till the next day, could I have been accommodated; but finding that impracticable, owing to the number of people that were come from the distant towns and villages, to be present at the fête, I made the best of my way, the same evening, to Lausanne, about six miles further.

This joyful day, as I was informed, was to close with a ball given by the people of the
country, and other in the spirit of private individuals. In short, there was a ball
and to nothing else at the time that so pleasant a night—every one appearing to be
one and the same idea of treating each other happy, and assured, and no problem
in government, and with such excellent dispositions on the part of the people, it would
be astonishing were they not in reality.

I indeed so delighted and pleased was I with what I had seen and heard, that I
could not leave the next day, could I have been recommended, but feeling
that it was not right to the number of people that were from the distant
towns and villages, to be present at the fair, I made the best of my way the next
evening, to the place, about six miles distant.



Nº 16



A.B.

LAUSANNE AND ITS ENVIRONS,

INCLUDING

THE TOWNS WHICH SCREEN THE EASTERN EXTREMITY
OF THE LAKE OF GENEVA.

AGREEABLY seated as Lausanne is, on the declivity of the hill Jorat, about four hundred and fifty feet above the surface of the lake, it offers, from its environs, two noble and magnificent, and at the same time dissimilar, prospects, though equally commanding a view of the whole extent of the lake, both on its eastern and western banks. (*Vide N° XVI.*)

The part which looks towards the east possesses the combined properties of the majestic and beautiful; for the water, reflecting the stupendous mountains which serve as its barrier, contributes apparently to enlarge their bulk; while an assemblage of hills, meadows, and villages, increase, by the varied effects of light and shade, the beauty and animation of that delightful landscape, of which a pile of abrupt rocks and tremendous mountains, crowned by the great St. Bernard, terminate, at no considerable distance, the horizon. The western view, although varying from the preceding, is by no means less interesting, for there the lake appears to lose itself in the horizon; while, in several places, when the clouds conceal the top of the mountains which skirt this noble basin on the right and left, it exhibits the appearance of an arm of the sea, such as at Southampton, when viewed from Spithead. This appearance does not, however, confine the eye from wandering on its fertile banks to a considerable extent, taking in the rich and abundant plains of Chablais, visible in the back-ground. But as history ought to precede description, I shall here, in conformity with the plan of this work, present my readers with a sketch of the history of this city, from its origin to its present state.

Lausanne, otherwise *Lausodunum*, or *Lausonna*, according to Antoninus's Itinerary, is of ancient date, as is evident not only from the medals which have been dug up in its neighbourhood, but also from a Roman inscription discovered at Vidy, a small hamlet

about a mile from the town, among many fragments of antiquity, in which mention is made of the inhabitants by the appellation of *Lausonenses*. And it also appears, by the Theodosian table, that, at the time of the lower empire, this part of the lake was called *Lacus Lausoniis*. Some historians have supposed that the present is not the original site of the town, but that, on the contrary, it formerly occupied the spot where the little village of Ouchie, or port of Lausanne, now is, which lies on the edge of the lake, about a mile and a half from the city, and, as it were, directly under it: not, however, knowing any fact which gives probability to this supposition, I shall content myself with this slight mention of it. Certain it is, that Lausanne has not been exempt from calamities similar to those which desolated the Pays-de-Vaud, and the major part of Switzerland, &c. at the commencement of the present æra, and that it then ended, like many other cities, in becoming a province belonging to the German empire. In the year 450, the city of Avanche was entirely destroyed by Attila, and the bishop's see was removed to Lausanne at the beginning of the sixth century, where the prelates, in imitation of those of Geneva and Sion, soon after succeeded in appropriating to themselves the whole jurisdiction, both temporal and spiritual, of their different dioceses—extending even the latter over the whole of the Pays-de-Vaud, the greater part of the Swiss cantons, and some of the French provinces.

Respecting the temporal jurisdiction (in the sequel ceded to this city by the emperors, as well as the right of coining money), its inhabitants enjoyed greater privileges than those of Geneva and Sion, privileges granted by the empire at different times; besides, after the extinction of the ancient family of the Zeringhens, emerging again from under the sovereignty of the House of Savoy, they were particularly indulged by their bishop, who, towards the eleventh century, took the title of Prince of the Roman Empire and Count of Lausanne. This did not, however, prevent the people themselves from forming, in 1368, their laws into a code, called *placitum generale*, the *general decree* or *resolution*. These laws continued in force until the introduction of the reformed religion, in 1536, by Pierre Viret and Farel, which obliging the bishop to retire, he went to Freyburg, to which the episcopal see was soon after transferred; and the inhabitants quietly gave themselves up, with the town and territory thereunto belonging, to the canton of Berne, who, on the reduction of the Pays-de-Vaud, not only confirmed this city in all its ancient privileges, but granted many in addition. Among these were the high and low jurisdiction, both civil and criminal, as well as the enjoyment of different

portions of church-land; so that the government of Berne reserved to themselves only the right of sovereignty, with power to pardon *en dernier ressort*, and to coin their money.

This town likewise appoints its own magistracy, consisting of a burgomaster, five bannerets* or *venner*, three councils, viz. the Lesser, that of Sixty, and the Great Council, besides other inferior officers. The Lesser Council is composed of five bannerets, twenty counsellors, one secretary, the great *sceautier* or keeper of the seals, and comptroller, over which presides the burgomaster. Its members are elected by the Grand Council, who appoint them by a majority of votes; and these, in their turn, have the privilege of naming the one of Sixty, consisting of five bannerets, twenty counsellors, and thirty-five members. To the latter council is confined the decision of civil causes not exceeding two thousand livres in value; for, beyond this sum, the senate of Berne is referred to. As for the Grand Council, or that of Two Hundred, which is considered as the first of the three, it is also formed of five bannerets and twenty counsellors, with the addition of seventy members taken from the two former, and one hundred and five other members, over whom presides the burgomaster, accompanied by his secretary and keeper of the seals.

This council assembles once a year only, in order to appoint to the vacant seats in the jurisdiction of the town, &c.; besides, there is a particular tribunal for criminal causes, which are afterwards decided in the Lesser Council by a kind of jury, chosen from among the proprietors of the Rue-du-bourg, who have that exclusive privilege: sentence of death, however, cannot be pronounced, except by the senate of Berne, who judge, as before observed, *en dernier ressort*. As Lausanne, in consequence of the privileges enjoyed by its inhabitants, and its forming one of the principal bailiwicks in the Pays-de-Vaud, the bailiff, on his arrival, takes an oath, in the presence of the council and *bourgeoisie* of the town, to maintain their rights and franchises†, and not allow them to be violated or infringed without opposing such measures. His residence is in the

* In German *venner*, a title given in Switzerland to civil magistrates, according to an ancient custom of carrying the colours or banner of the city or district at the federalisation or confederation of the cantons, as well as in the wars they had to sustain, in order to establish their liberty. These magistrates are four years in office, and are charged with inspecting the civil and military police of their respective districts.

† Since the French revolution, the inhabitants of Lausanne have unfortunately lost a part of those privileges, owing to the indiscretion of a few individuals, who, being ill-advised, endeavoured to stir up the people against the senate of Berne.

château heretofore belonging to the bishops, which commands the city, from its elevated situation.

This town is celebrated, in history, as the place of the interview, in 1275, between the pontif, Gregory X. and Rodolphus I. king of the Romans, who had previously refused to proceed to Rome to be consecrated; as also for the council, held in 1448, to ratify the abdication of Amadeus VIII. duke of Savoy, then pope, under the name of Felix V. who voluntarily resigned the pontificate for the purpose of terminating a schism in the church of Rome, and afterwards retired to enjoy a peaceable and tranquil life in the monastery of Ripaille in Savoy, a spot contiguous to the lake, leaving the tiara to Nicolas V. who was acknowledged the lawful pope.

Lausanne, as well as most of the capital cities and towns in Switzerland, contains within its walls abundant helps to philosophic and elegant study, which are to be had, as at Geneva, gratis, the professors of their academy being in like manner paid by the state. This public institution, which is now under the jurisdiction of the senate of Berne, was founded in 1537, soon after the Reformation, and consists of several professors in theology, Greek, Hebrew, philosophy, mathematics, belles-lettres, civil-law, and medicine, and has produced many eminent men, both in literature and the sciences. Nor must we omit to mention, that this academical institution provides exhibitions, or annual pensions, for forty-five indigent scholars, to support and enable them to go through their course of study.

The public library, though less considerable than that of Geneva, has many valuable and scarce books, manuscripts, &c. Here are also several literary cabinets, where, for a very moderate subscription, admission is easily gained.

The principal buildings are the hospitals, which are extremely well regulated, and the cathedral, originally dedicated to the Virgin, an edifice well worth attention, both from the magnitude and highly-finished execution of the work, from its being esteemed the most complete of the kind in Switzerland, and from its containing various marble monuments and Gothic inscriptions. The town-hall and arsenal are fine structures; and many of the private houses also are handsome and well finished.

The site of the town is so extremely irregular, that it includes within its walls three hills of no inconsiderable height, which render the streets uneven, and on a continual ascent and descent. The one which stands at the north side of the town is called *la Cité*, that towards the south *le Bourg*, and the third, at the west, *le Quartier de*

St. Laurent. These hills are formed of sand-stone, nearly similar to that found in the neighbourhood of Geneva; though, from having more coherency, and being less subject to exfoliation, than the Geneva stone, it is deemed preferable for building. The colour is a greyish blue, and cement calcareous, nevertheless containing several particles of mica and argillaceous earth.

The surrounding country about Lausanne is as beautiful as language can describe; but the scene which will most please the benevolent philosopher, is the genuine appearance of prosperity, content, and cheerfulness, among the inhabitants themselves, arising from their civil codes and institutions being calculated for the benefit of the governed; for, if happiness be considered as the result of a tranquil and easy mind, where should that blessing be found, if not in a country where the comforts of life are easily obtained, and where the laws indiscriminately protect natives and foreigners, the poor as the rich, and the unlettered rustic equally with the man of erudition?

The air of Lausanne being esteemed salubrious, the society delightful, and the articles of the first necessity extremely moderate, though at present much dearer than they were some years back, this city is resorted to by strangers, who not only make it their residence during the summer, but send hither their children, from various parts of Europe, to complete their education. It speaks in favour of this place, that the celebrated Mr. Gibbon chose it as his favourite residence, to complete his valuable work on the Decline and Fall of the Roman Empire; and what I have advanced above may have induced him to give Lausanne the preference.

Some excellent books have been printed at Lausanne, and there is some business done in jewelery and plate; but, on the whole, its trade is inconsiderable, nor do the principal inhabitants discover any wish to engage in mercantile pursuits.

Before I leave this city, I must recommend the view from the summit of the hill where the signal is placed, which, from its extreme height, commands a vast tract of country; and also explain the origin and utility of the vast number of signals seen all over Switzerland.

The Swiss call *signaux*, or signals (in German *hoch-wachten*), piles of wood and heaps of straw, placed on the top of their highest hills, at certain distances from each other, with a hut, or kind of *corps-de-garde*. The care of attending each of these, in time of war, is frequently entrusted to a piquet of soldiers, who, at the approach of the enemy, or any other danger, set fire to the wood by night, and the

straw by day, for the purpose of alarming the cantons, and giving the inhabitants sufficient time to join their respective corps.

The care with which the Helvetic body guard their frontiers cannot be sufficiently admired, particularly in times of surrounding hostilities, preserving a respect for their neutrality, by keeping continually in readiness, to oppose force by force, a very considerable cordon of troops, should the belligerent powers attempt to violate their territory: and in case the number on duty be found insufficient, by lighting the signals, in a very few hours, upwards of three hundred thousand of some of the best troops in Europe would be on their march (though composed of militia only, the military in Switzerland being formed of no other), and repair to the field of battle, preceded by their banners, and followed by cannon, baggage, &c. As every citizen is a soldier (the clergy excepted), in case of emergency, one hundred thousand more might with ease be raised; their military regulations being such, that each state or district of the Helvetic body may be considered as an army in cantonments, ready to move at a moment's notice.

It is certain, that the character of a militia-man of any particular canton is not only looked on as an honourable distinction by the Swiss in general, but is in fact held in such estimation, and so encouraged by the laws of the country, that an individual dares not appear in a court of justice without his uniform and sword, under pain of being fined for the neglect of this *étiquette*. In several of the cantons, the peasantry cannot gain permission to marry without first applying to the magistrates, dressed as above, with their guns in good order, the pouch well filled, and a bible.

By these judicious regulations of their government, and that degree of confidence which every individual places in his own personal courage, added to an enthusiastic *amor patriæ*, which, by increasing every attachment to what they hold most dear,—the defence of their aged relatives, wives, and children,—the Swiss have been capable of preserving the blessings of peace for the space of three hundred years. Satisfied and contented with their possessions, they quietly enjoy them, without envying their neighbours, and are confident of being enabled to defend their territory against the unjust and arbitrary attacks or encroachments of an inconsiderate enemy. They wisely avoid war, without fearing it; and do not interfere with that cruel system of politics, which has for years been the cause of shedding torrents of blood, to little purpose, in different parts of Europe.

The road from Lausanne, by the gate *la Cité*, has a considerable descent for the space of three miles, along the sides of luxuriant vineyards, which cover the southern

surface of the hill de la Vaud (famous for its wine, a great quantity of which is annually exported), and continues close to the edge of a range of rich pasturage, stretching to the very banks of the lake. This hill, about nine miles in length, is a continuation of the Jorat, of the sand-stone of which it is in great part formed, and nearly similar to that found in the quarries in the vicinity of the town. An extensive forest of firs, interspersed with meadows, covers its entire summit, where the vines are not cultivated.

From Lausanne to Lutry, the next town, I noticed, in several places, large blocks of pudding-stone of the primitive order, with their angles nearly rounded, resting on strata of sand-stone belonging to the above mountain, and even sometimes buried in their crevices or fissures. Now, it is perfectly manifest, that these stones cannot have been carried thither, unless by some great commotion or revolution of the earth, which not only caused them to be detached or loosened from the high Alps, but, by some certain force, transported them to where they now lie. The reason why I am induced to consider these pudding-stones as primitive, is their being entirely formed of pebbles, which do not effervesce with acids any more than their cement, which is of the nature of silex and argil: even the sand found in their interstices appears to be totally composed of vitrifiable parts, such as quartz, and different particles of rock-crystal. The road then proceeds through Cully (another small town, and the last before arriving at Vevay), the environs of which are more curious than agreeable, from the road which leads to it being nearly the whole way wedged in between walls rising above walls, which serve as inclosures to the different vineyards, the property of individuals who reside there; and though I could not by any means feel much partiality to such a road, finding myself dreadfully incommoded by the heat, the sun being intense, and its beams most forcibly reflected by those extensive walls, yet could I not help admiring the indefatigable industry of the inhabitants of that part of the Pays-de-Vaud, who, by hard labour and perseverance, and at a great expense, have erected a number of terraces, one above the other, and, by covering them with earth, have forced a mountain, abrupt and barren, to yield the most delicious wine of Switzerland.

From Cully the road imperceptibly becomes more cheerful, and the structure of a mountain on my left offered a greater variety, both in form and production of soil; besides, I again noticed huge rocks of pudding-stone dispersed, though not of similar species to those before observed between Lausanne and Lutry,—these being composed of thick strata, mostly separated by argillaceous shelves or zones, and sometimes even

by a kind of tender lamellated sand-stone, having the pebbles of which they are formed, in general of the secondary order, lying in irregular strata, nearly horizontal, few of their angles rounded, effervescing with acids, and their cement almost every-where of calcareous matter. These circumstances make it natural to infer, that this kind of pudding-stone doubtless owes its formation to some cause posterior to the one which formed the primitive, which have invariably more coherency than these, and do not effervesce with acids.

The sameness of some parts of the road was agreeably diversified by a number of cascades, formed by the junction of rivulets, which descend abundantly from the summit of the same mountain, and then glide away in silvery streams. The one that afforded me the greatest pleasure, and I am inclined to think will particularly strike the traveler, stands on the left, before reaching the town of St. Saphorin; and, as it is the drain of the Bro, a small lake situate on the top of the mountain, a most solitary and romantic spot, the fall is at all times considerable.

This small town, three miles from Vevay, is extremely pretty, and pleasingly seated on the banks of the lake. Some remains of a Roman *via*, or road, have been discovered in its environs, as likewise a kind of column, or mile-stone, at present placed in the principal church. On the column is the following inscription, from which it appears to have been erected in honour of the emperor Claudius, about the year 46 of the Christian æra:

TIT. CLAUDIUS DRUSI F. CÆS. AUG. GERM. PONT. MAX. TRIB. POT. VII. IMP. XII.
P. P. COS. IIII. F. A. XXXVII.

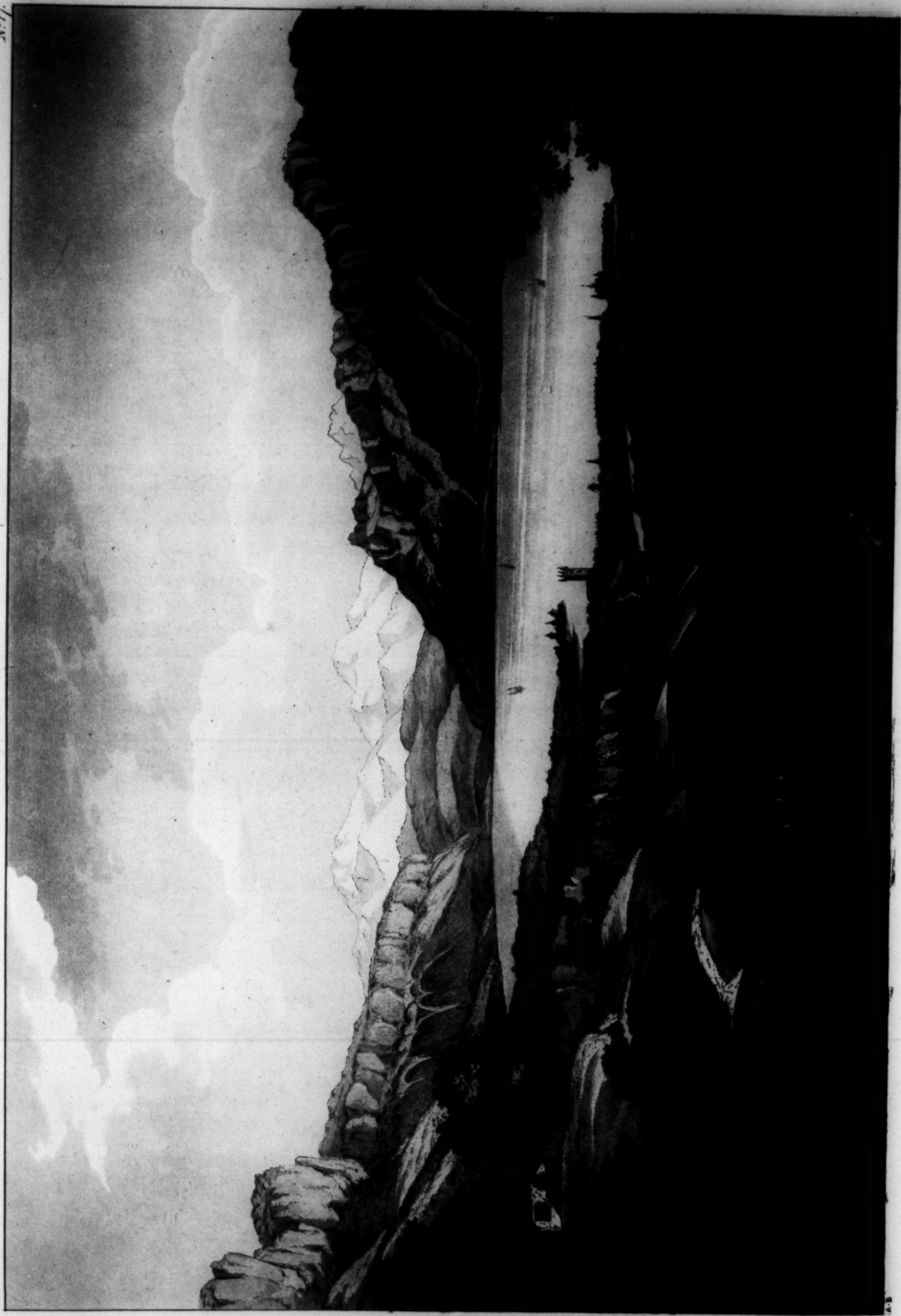
Besides these vestiges of antiquity, there have since been dug, in the neighbourhood of Cully, several Roman medals, inscriptions, and a pedestal, which, from its ornaments, seems to import not only that the vine was cultivated by the inhabitants of this country in the time of the Romans, but that they even paid homage to Bacchus; for on one of its compartments are the following words:

LIBERO PATRI COCLIENSI.

From St. Saphorin, the road, which follows the fertile banks of the lake, takes a more southern direction, and the beautiful landscape I had been so long contemplating seemed gradually to expand, while its rural and picturesque objects assumed a more varied, lively, and harmonious tint as I imperceptibly drew near Vevay, the most delightful town in Switzerland, at twelve miles distance from Lausanne. In my way



Nº 17



I crossed a noble stone bridge, thrown over the torrent Veveyse, which takes its source among the mountains of Freyburg, forming, by its sediments, some *atterrissemens*, or banks, at its entrance into the lake. An accurate representation of Vevay, its situation, and profile of the mountains of Savoy and the Valais, is given in N° XVII. which likewise includes an idea of the course of this torrent, contiguous to the town, showing the abrupt state of the hills which serve as a boundary to the deep channel dug by the impetuosity of its waters.

The structure of these hills is certainly extremely curious and singular, from the amazing variation which takes place in the direction of their strata, and the matter of which they are composed, though mostly formed of a species of soft lamellated sand-stone, mixed with argillaceous earth. They likewise join, on their southern side, the mountain of Chardonne, at the basis of which stands Vevay. This mountain has the appearance of being in great part composed of the same kind of pudding-stone as those near St. Saphorin, with this difference only, that those which are mostly calcareous are in several places streaked or veined with wide shelves or bands of white spath, having their strata more parallel with each other, though on the eastern side.

The town of Vevay, which stands at the foot of this mountain, in lat. $46^{\circ} 30'$, long. $7^{\circ} 12'$, is ancient, and appears to have been the *Viviscum* of the Romans, or otherwise *Ribiscum*, according to Antoninus's Itinerary.

This charming spot is most enchantingly situated on the banks of the lake: its streets are wide, the houses tolerably well built, and the town infinitely more agreeable, as well as more commercial, than Lausanne.

After the reduction of the Pays-de-Vaud, in imitation of the former, it likewise gave itself up to the canton of Berne, which, in like manner, left the inhabitants the full enjoyment of their ancient privileges, and granted them new ones, which were more considerable. One of the most capital branches of commerce carried on in this little town consists in the exportation of Swiss cheese, though more particularly that of Gruyère, made in the canton of Freyburg, about fifteen miles from Vevay. The tanneries are likewise very productive, their leather being much esteemed both in Switzerland, France, and Savoy; and the inhabitants make a considerable traffic in jewelery, silversmiths' goods, silks from Italy, &c.

Vevay also resembles the other Swiss towns, in having, like them, a public college, where philosophy and the belles-lettres are taught gratis, and which is esteemed the next

in excellence to the academy at Lausanne. Among its inhabitants, who are in general extremely pleasant and attentive to travelers, are several of great merit and information; so that, with this advantage, added to what it derives from its situation, of being seated at the basis of high stupendous mountains, consequently sheltered from the north wind, and enjoying a climate much milder than that of any other town in the Pays-de-Vaud, it becomes particularly attractive to strangers, who are thereby tempted to make a long stay in it, and have, in many instances, preferred it to either Lausanne or Geneva,—a circumstance which has not only served to enliven the society, but rendered it an enviable spot, though excessively hot during the summer.

On the other side of the lake, nearly opposite the *plage*, or beach, in general covered with small boats belonging to the Savoyards, who bring hither the productions of their soil to barter with those of Switzerland, stand the abrupt and romantic rocks of Meillerie, so celebrated by the sentimental pen of J. Jaques Rousseau, in his *Nouvelle Héloïse*: and as it is at the foot of those rocks that the depth of the lake is most considerable, it is also in their vicinity that the inhabitants of those parts have, at different times, seen the effects of water-spouts. One of these phænomena was perceived so lately as the 1st of November, 1793, at five and thirty minutes after eight, A. M. between Meillerie and Evian, from the opposite side. Having had the satisfaction of being favoured with an account of it, soon after it had occurred, and that account appearing exactly to co-incide with the one since given by monsieur de la Métherie, in the French Journal de Physique of the same year, I have a pleasure in subjoining the principal facts relating to it.

“ The water-spout distinguishable on the 1st of November, 1793, appeared like an immense column, standing on the surface of the water, to the extreme height of about two thousand two hundred and fifty feet, with a base of three hundred and ten in diameter, and remained stationary for the space of four minutes and a half at most, and then vanished as suddenly as it had appeared.

“ During this time, a vast motion and great agitation, or undulation, on the surface of the water, were visible, though more particularly so where the lake made its junction with the basis of the water-spout, for the latter appeared as if descending suddenly from an extremely thick cloud, which tended in a direction from north to south-west.”

Such is, in part, the description I received of a phænomenon, which, though at all times considered as worthy the attention of philosophic observers, must in this instance

become more particularly interesting, from there not having been any previous example of similar appearances at that time of the year, added to the temperature of the season, and, one might almost say, the non-electric state of the atmosphere.

From Vevay the high road continues, for some distance, along the banks of the lake, and at the basis of Chardonne, the mountain already noticed, which is in that part entirely covered with vines. Among the number of hamlets and small villages through which I passed, Clarence was soon discernible, and filled my mind with a pleasing enthusiasm, while gazing on a spot not only beautiful by its situation, but which forces itself into notice as chosen by the Genevese philosopher for the residence of his beloved but unfortunate Julia. In fact, the interest which I took in the landscape before my eyes led me to believe, that, of all the various parts of Europe through which I had previously passed, no country was so proper for the enjoyment of that enchanting picture of rural life, so pleasingly painted, and with so much truth, by this inimitable writer, as the one he had selected.

For the first time since my departure from Geneva, I here began to perceive some calcareous rocks, though apparently without any regular order; for the pudding-stones, of similar species to those in the neighbourhood of Vevay, are in great masses, confused and intermixed with the former: but, as I drew near Chillon, I noticed some of the same rocks, which are even of the height of fifty feet, coming, as it were, from beneath the lake, or at least in many places serving it for a barrier. They are however more streaked with spath, and harder than the first, for which reason they are used for mill-stones by the inhabitants, who not only make them for their own use, but furnish most of the cities and towns of the Pays-de-Vaud with this article.

Between these calcareous rocks and pudding-stones, the strata of which are extremely inclined toward the eastern side, I remarked a variety of species of sand-stone, and lamellated argillaceous matter, resembling schistus, which had different directions, and varied both in colour, structure, and hardness.

This variety of matter was sometimes placed on thick strata of pudding-stones, and sometimes in their interstices, or else leaning against the sides of the calcareous rocks. These appearances have led me to presume, that those stones must naturally have been deposited there at some epoch posterior to the formation of those which serve as their support or basis, or, in other words, at a time when the waters of the lake covered the major part of the mountains which are now its limit or boundary.

At no great distance from the small village of Chillon stands the château, an ancient and respectable building, situated on a rock in the lake, constructed in 1238 by Amadeus IV. count of Savoy. This castle, for a length of time, served as a place of strength, or fortress, to the descendents of that illustrious house; but, since the reduction of the Pays-de-Vaud, it became the residence of the bailiff of Vevay, until the removal of the bailiwick to the town itself, when it was used as a magazine for the republic, and latterly as a state-prison. Such have been the various changes of a fabric, the ancient and majestic appearance of which so exactly corresponds with the wild romantic beauties of the surrounding country, as to have been chosen by Rousseau for the fatal catastrophe of the heroine of his novel, it being when on a visit at this castle that she fell into the lake, to rescue her son from the watery grave; which accident was soon after the cause of her death,—so that it is impossible to view this spot without recollecting every circumstance of that pathetic tale.

Having left Chillon, I proceeded to Villeneuve, situate at the extremity of the lake, about a mile and a half from the château.

OBSERVATIONS

ON THE

FORMATION OF MOUNTAINS IN GENERAL;

AND MORE PARTICULARLY OF

THOSE WHICH SCREEN THE LAKE OF GENEVA;

WITH THEIR CONSEQUENCES,

IN ORDER TO EXPLAIN AND ELUCIDATE THE ORIGIN OF THE LAKE ITSELF.

IMPRESSED with a conviction of the extreme difficulty which must attend the deduction of any thing in the form of a system, from inspecting or examining those effects or consequences which now present themselves to our view in the great and stupendous features of Nature, and of ascertaining the various revolutions which the earth has undergone, from its first great shock, or convulsion, through sundry subsequent periods to the present, I venture, with extreme diffidence, to hazard my sentiments or conjectures on the causes which appear to me most likely to have operated in producing, in most of the mountains and hills which constitute the Alps (though more particularly those which environ the Lake of Geneva), that difference in their direction and structure, as well as abruptness in their strata, which is at present so conspicuous. It is with no less diffidence that I shall annex some notice relative to the formation of the beds of sand-stone, in many places intermixed with others of pebbles, sand, and sometimes with a species of calcareous pudding-stone, gypsum, lithanthrax, or fossil-coal, &c. and, in fine, my ideas on the origin of the lake, the valleys which terminate contiguous to it, and the great revolutions doubtless experienced in that part of the Alps prior to the formation of this extensive and noble basin. Yet before I dare propose my conjectures on such difficult and important subjects to geology, it may be necessary to observe, that the present work, as well as my former publications, being simple narratives, or local descriptions, to which I have subjoined reflexions or observations spontaneously occasioned by the curious state of the places which I visited, I have avoided, as much as possible, long and tedious details on geology and lithology, reserving to

some future day the design of giving a more ample explanation of those sciences, as a supplement to my *Tableau des Alpes*, a work begun about twenty years ago. I shall here likewise inform my reader, that, knowing the extreme, and I may add the almost insurmountable difficulties, experienced by those who hitherto have endeavoured to give a general theory of the earth, I am far from wishing to be understood as attempting such an undertaking,—being thoroughly convinced, as mentioned in a former work, that it must be deemed impossible to proceed with certainty in this laborious and wide pursuit, and to explain the solution of that great problem, until a sufficient number of facts and observations be collected on the subject, in order to draw some certain consequences from them, to serve, as it were, for a basis; and which, not being repugnant to our judgement, shall agree with the curious and wonderful natural phenomena with which our globe abounds. Nevertheless, as it is impossible to make any considerable progress either in geology or lithology, without having previously formed some notions on the origin and formation of mountains, I shall here subjoin some few ideas relative to those subjects.

As to the origin of the primitive mountains, naturalists are at present mostly agreed that their formation may be attributed to an aggregate crystallisation of vitri-fiable parts, such as quartz, feldspath or felspar, mica, schorl, &c. originally crystallised in the menstruum, or ambient fluid, which at that time covered the globe to such an extreme height as to surpass the tops of the most elevated peaks of the Andes or Cordeleras, in South America, as well as the primitive chain of the Alps, &c.

The above supposition, which seems highly probable, as every thing may be said to evince the truth or certainty of it, is entirely due to the great progress lately made in crystallography, by which nearly all the different and various forms or figures adopted by the particular salts and crystals are at present determined or defined. From this it results, that the granites, which are only a compound of small crystals, as before mentioned, adopt, almost every-where, a polyedrous figure, the masses of which have, in course of time, by their *entassements*, or heaping one on the other, formed those stupendous spiry peaks, called by the inhabitants of those countries pyramids, cones, and *aiguilles*, or needles, which constitute the primitive chain of the Alps, Andes*, and other mountains of like magnitude.

* There is, however, in this chain, a number of volcanoes of great height,—a circumstance hitherto wholly unknown in the Alps.

Owing to the extreme irregularity which takes place in the structure of those mountains, and the confusion with which their constituent parts are united, added to their position, and the singular arrangement of the metallic veins they contain, it is reasonable to infer that their crystallisation may be considered as interrupted or retarded,—or, in other words, that it had been effected at a time when the fluid in which it was taking place (which kept in a state of dissolution and suspension every particle of that crystallisation) was extremely agitated; and that besides, in that state of agitation, it acquired a degree of heat from the subterraneous fires, which, to all appearance, seem to have existed even at that epoch.

To this argument, I grant, may be objected, that, as all the primitive matter which forms the granites and porphyry does not apparently contain any, or at least but a very small portion of acids, their crystallisation cannot be so easily conceived: yet if we observe that the felspar, zoölites, gemmæ, as well as most of the vitrifiable stones, as the schorls, silex, &c. which, in the first place, contain particles of siliceous earth; 2dly, calcareous matter, in a caustic state; 3dly, magnesia, in a similar state; 4thly, argillaceous earth; and, 5thly, ferruginous matter; and that each of those earths are soluble in water, it may be supposed that they have served as a dissolvent to each other, and afterwards crystallised when circumstances were favourable to them,—it being now a received, and, I believe, a general opinion, that bodies, or substances, which are in a dissolvent state, are capable of crystallisation (if not prevented by some cause), as sulphur, metals, and even phosphorus: in fine, water, in a congealed state, is it not a true pure crystallisation? But if the above facts, added to many others, which might be deemed tedious to enumerate, leave scarcely a doubt as to the manner in which the formation of the primitive mountains has been effected, it does not still appear quite so easy to prove that the secondary and tertiary ones owe theirs to a similar cause, though all appearances tend to demonstrate that they do, which seems likewise to strengthen the preceding conjectures; for supposing they owe their existence to an effect or operation of pure and direct precipitations, as well as to the successive sediments of the sea, why, may it not be asked, are there not some of the same kind continually forming at the bottom of the ocean?—a circumstance which we know not to be the case.

It is true that there are naturalists who still attribute the formation of the major part of the secondary and tertiary mountains to the reiterated operations of volcanic effects,—subterraneous fires, as before noticed, being supposed at that time to have been very

numerous; but as for myself, who am neither a Neptunian nor a volcanist, and have no view of establishing an absolute system, yet, from having attentively considered the different effects arising from the great changes and revolutions which have taken place in the natural world, I am of opinion that the operations of fire, as well as water, as mentioned in my Maritime Alps, have in all probability acted at times together, and at others separately, in giving those mountains their present degree of elevation, the confusion and disorder so visible in their strata, that irregularity in their form, and abruptness and heterogeneity in their mass; but, as to what relates to their origin, I am still led to suppose them to be the mere effect of a true crystallisation, effected at different times, and with different modifications.

These conjectures, into which I have been led by my own repeated, and, I may add, assiduous observations, while exploring the various chains in Europe, have been sanctioned by other naturalists, who appear, from their survey of the same phenomena, to have adopted similar ideas; and they have induced me to attribute the origin of all rocks of the compound class, which have distinct or regular strata, as also those of the refractory, and the major part of the vitrifiable, such as schisti, horn-stone, rock-stone, kneis or feldspath, some kinds of sand-stone, marbles, and even the calcareous stones, which are of close texture and a greyish hue, but which do not contain any impressions of fossils, to a second crystallisation, effected at an epoch posterior to the one in which the granites and porphyries were formed: I conceive them likewise to have been formed in a less agitated fluid, which circumstance has doubtless decided the parallelo-piped figure of the secondary rocks in general; for those molecules, then held by the sea partly in a dissolvent state, and partly in suspension, having full liberty to move *inter se*, and consequently power to obey the laws of affinity, the result has in the end formed that kind of regular crystallisation.

It may not be, at the same time, improper to observe, that the irregular directions, which in general affect a great part of the secondary mountains, as well as the different thicknesses exhibited in their strata, ought to be attributed to accidental obstacles only, which have, for the moment, prevented their crystallisation. But as for the tertiary mountains, or the species of calcareous, which contain fossils, various kinds of marbles of similar species, aluminous schisti, gypsum, fluor, phosphate of lime or assatite, borax felspar, indurated ditto, vitriolics, and even different sorts of pit-coal, it is easy to conceive their crystallisation, those bodies being composed of a mixture of earths modified

with acids and mineral alkali, and an oleaginous, or rather bituminous, matter. Hence it also seems probable that the mountains of this class owe their origin to an epoch vastly posterior to the one in which the two former were formed, as appears to be clearly demonstrated by the number of animal and vegetable fossils found imbedded in them,—whereas the others do not contain any,—as likewise by their resting, in several parts of the Alps, on primitive and secondary mountains, as mentioned in both my *Rhætian* and *Maritime Alps*.

Besides these three great lithological divisions, which only differ by some modifications in the manner of their crystallisation, as also in the period in which their operation was performed, and which naturalists have since sub-divided into a variety of classes, orders, genera, species, &c. a fourth class may be considered, including every kind of sand-stone, even with calcareous cement, pudding-stone with similar cement, some species of tuffa, cæspes, tourbes, or peats in general, &c.—attributing the origin of those bodies to the successive deposits, sediments, or accumulations of the sea, and their density and hardness to the more or less saline or bituminous particles, still kept by the sea in a state of dissolution at the time of their formation.

Stones, nearly similar to the above, the sea, in like manner, continues to form along its shores, as I have frequently observed; though no-where, that I know of, so conspicuously as in the Island of Portland. A circumstance, however, which accompanies this species of sand-stones, is, that they have not the same consistency as those of the secondary order: but this may be easily accounted for, from the sea no longer keeping in a state of dissolution the same portion of saline, calcareous, and vitrifiable parts, as it originally did.

Having now suggested my ideas on the formation of mountains in general, including their division or classification, I shall subjoin some remarks on the origin of the major part of the valleys belonging to the Alps, which will of course, in this place, lead me to speak of that of Geneva.

As it may be recollected by the readers of my *Rhætian Alps*, published in 1792, that I there stated, that all my investigations induced me to believe that the sea had, at different periods of time, carried itself alternately from the poles to the equator, and from the equator to the poles, and that this kind of vibration, or flux and reflux of the fluid, might be attributed to an imperceptible, but successive, approach and retreat of the poles of the ecliptic to and from those of the equator,—I shall here venture to add, that this

hypothesis, instead of losing ground, has, on more mature consideration, greatly enforced itself, in consequence of a series of reflexions deliberately made on that subject, as well as from having read some hints thrown out by monsieur de la Métherie, in his *Journal de Physique*, which, in a great measure, correspond with my own,—this eminent naturalist having been obliged to philosophise in a similar way on the causes which have produced the singular and surprising appearances observable on our globe.

This hypothesis, I readily acknowledge, is open to objections; as, in the first place, the action of the planets on the nodes of the earth's orbit might possibly be alleged; secondly, that this diminution of the angle formed by the ecliptic and equator, at present known to exist, may be caused by the sole action of the planets on the annual revolution of the earth, which forces it insensibly to change the direction of its orbit. Such, indeed, might be the objections, which are doubtless admissible, and which, on a future day, I purpose elucidating more at large; yet, in fact, do they only serve to prove the impossibility of a perfect parallelism of the poles—a circumstance by no means necessary to produce all the effects which a too great or near approach of the poles would naturally occasion on the globe, particularly if it be considered (supposing the formation of the primitive mountains by crystallisation) that the sea need not have risen towards the equator higher than about nineteen thousand four hundred feet, which, though the elevation of the highest peaks of the Andes, is scarce more than the two thousand one hundred and sixty-sixth part of the diameter of the earth at the equator.

But, without entering at present into a more minute detail on this subject, I shall pass on to the different facts and data which I consider as the basis of my supposition; viz. First, that the diameter of the earth, under the equator, being found, by the several mensurations, to be seven millions nine hundred and forty thousand five hundred and ninety-eight English miles, and the poles, seven millions nine hundred and three thousand six hundred and fifty, it of course appears that the earth's equatorial diameter is to that of the poles as 215 to 214, or, in other words, that the former surpasses or exceeds the latter by $36\frac{248}{1000}$ miles,—so that there remains no manner of doubt but that the figure of the earth is now fully determined to be an oblate spheroid. Secondly, that since this figure of the earth perfectly co-incides with the laws of gravity, fluidity, and centrifugal force, heretofore explained by Newton, there can therefore exist no doubt that the surface of our globe was once entirely covered by the sea. Thirdly, that as

at present nearly one half of this same surface of the globe is discovered, which we consider as forming our continents and islands, the sea can only have receded by the following causes: 1st, by evaporation, which must, at that period, have been very considerable; 2dly, by a precipitate retreat into the interior of the globe, by the outer crust of large caverns falling in, or by the sea finding its way into the cavities of the earth; 3dly, by a kind of transmutation from the poles to the equator, or, finally, by the power of the three acting together at one and the same time. Fourthly, that there was doubtless a time when the centrifugal force was infinitely more considerable than at present, and, according to the three unalterable laws of nature, viz. gravity, fluidity, and centrifugal force, above established, the latter must have forced the waters which covered the poles to recede, or throw themselves towards the equator; so that the sea, having thus risen to an extreme height near that circle, enlarged the equatorial diameter of the earth, and rendered its figure more spheroidal,—and, in all probability, at that period was formed the high chain of mountains situate between the equator and the forty-fifth degree of latitude, both on its northern and southern sides, which elevation gradually diminishes as they recede from the equator. Fifthly, that the cause of this receding of the waters from the poles towards the equator can have been no other than an extreme approachment of the poles of the equator and the ecliptic, which must nearly have co-incided; for the action of the sun being then pretty constantly direct between the tropics, its attraction must necessarily, in some measure, have greatly diminished that of the earth, and consequently increased the centrifugal force of the fluid by which it was then covered. This supposition appears greatly strengthened by the extreme tides even now felt at all times between those circles, though more particularly during the equinoxes, and when the moon is in conjunction or opposition with the sun; as also by the gradual diminution of those same tides, in proportion as they draw nearer the poles, where they almost disappear. Sixthly, that all appearances at present prove that approachment of the poles of the equator to those of the ecliptic, or, which is the same thing, to those of the tropics, if we compare the observations made upwards of two thousand years ago with those of the present æra; for the learned Greek astronomer Pythias, as well as Hipparchus, who lived two hundred and fifty years before Christ, found the inclination of the ecliptic to the equator to be at that time $23^{\circ} 51' 20''$; and Ptolemy, who lived in the fourth century, $23^{\circ} 50' 22''$; whereas the chevalier Louville, at the commencement of the present century, having gone to

Marseilles in order to repeat the observations heretofore made on the same spot by Pythias, found that the inclination was decreased to $23^{\circ}28'24''$: in fine, Messrs. de Lalande and la Grange, well known for their knowledge in astronomy and mathematics, have, in consequence of several interesting and curious observations, found, within a few years, the inclination of the ecliptic to the equator to be only $23^{\circ}28'0''$: whence those gentlemen have concluded, that there doubtless exists a gradual tendency to co-incidence between the two polar circles; and the diminution of the angle the latter has calculated at about thirty-six seconds in a century. Seventhly, that, as it is a fact well known that the northern part of our globe has a great deal less sea than the southern, and that most of the continents in the latter, which also comprehend more islands and volcanoes, terminate in a point, it may be reasonably presumed that the last retreat of the waters of the sea has, in a great measure, been performed on that side, or nearly from north to south, and that to the great or violent currents only (which at that epoch probably took place) may be attributed the sharp-edged or pointed appearance of the extremity of those continents. Eighthly, that, as the highest mountains of our globe are likewise all comprised between the forty-fifth degree of latitude on each side of the equator, and as the major part of those mountains are now acknowledged to owe their origin to the effects of crystallisation, the sea must then consequently have made a longer stay on that part of the globe, and covered it to a more considerable height than towards the poles, since that crystallisation could not possibly be effected without being in a fluid state; and that the major part of those mountains exceed eight thousand nine hundred yards above the level of the sea, whereas there are none found of equal height from the forty-fifth degree to the poles. Ninthly, that the rocks we denominate secondary are stated to be of posterior date to those of granite and porphyry, as they are often found lying on the latter; and those termed tertiary are deemed of still more modern date, since they are generally discovered resting on the two former, often containing different kinds of fossils, and impressions of bodies belonging to the animal and vegetable kingdoms; in fine, that the greatest part of sand-stones doubtless owe their origin or formation to the various submersions experienced by our continents. Tenthly, that these different submersions and emersions must have evidently produced a number of volcanoes and subterraneous fires, by the successive deposit of the mineral and pyritous matter contained in the water, part in crystallisation, and part in dissolution, which, having afterwards become heated by the contact of the water, as by the

effect of violent fermentation, during the different retreats of the sea, may be supposed to have formed a number of subterraneous caverns, into which a part of the water insensibly filtered, and which, in process of time, being converted into steam or vapour, raised up most of the strata belonging to the tertiary mountains, which then served as vaulted roofs to those caverns; for the force of expansion continually increasing by the effect of the subterraneous fires, and the resistance which opposed remaining nearly the same, these vaults naturally burst forth, soon after, with an excessive crash or explosion, in like manner as a vase well shut (were it even of metal), in which water had been converted to vapour by the effect of fire,—it being now known that the strength of water, reduced to vapour, is to that of gunpowder as 14,000 to 500. Eleventhly, that there certainly does not remain a doubt of the actual existence of volcanoes, or subterraneous fires, under the bottom of the ocean, in various parts of the world, there having been many instances of mountains rising out of the sea; as Monte Nuovo, near Naples, which acquired its present elevation in forty-eight hours; besides others in South-America, the Archipelago, &c. where there exist a number of volcanoes, some of which are in full activity, and many that have been extinct from time immemorial. Twelfthly, that it is highly probable that those volcanoes may have been, at different periods of time, submerged by the sea,—since there exist, in several parts of Europe, as Auvergne, Vivarès, Brisgaw, and along the Rhine, many of them, the lavas and craters of which are, even at present, almost covered by calcareous and argillaceous strata, containing various species of marine fossils. And again, lastly, that, besides the force of expansion and volcanic operations, the two great agents, which I consider as the original or primitive causes, which have produced the greatest part of our extensive valleys and lakes, I admit as probable, and perfectly consistent with the theory which I have advanced, that several lesser valleys, which may literally be termed galleries only to the former, likewise owe their formation to a sudden sinking or falling-in of their vaulted roofs, occasioned by the successive sediments left by the sea at the time of its different retreats; which sediments or weight, becoming superior to the resistance, ended by crushing them entirely.

Hence I am led to conceive, that from the above causes have resulted that confusion and irregularity which at present exist in the major part of the last-mentioned valleys: though to these might likewise be added the electric fluid, the effects of which must, at that period, have been very considerable, and no doubt have greatly contributed

towards producing, on the continents, many of the wonderful phenomena which excite our astonishment.

As all these facts and data, of which the number might be considerably augmented, are now generally established, I purpose making use of them to explain my ideas on the formation of the Lake of Geneva, and the valleys which there terminate, as well as to account in what manner the immense blocks of granite, or primitive rock, have found their way to the summit of most of the calcareous mountains which now screen it, and with which they have not the least affinity; and I can safely say, that, the more I have observed the structure of the different mountains situate between the Pennine Alps and the lake, including the Salève, Mont Sion, the Vouaches, the Jura, Jorat, and the major part of those which serve it as a barrier, the more have I been confirmed in my opinion, that, after the crystallisation of their nuclei, of which the different forms and directions had already traced the greatest part of our valleys, the subterraneous fires or volcanoes that afterwards existed, as also the caverns and fissures naturally formed during that crystallisation, were soon after, in great part, totally covered by the successive sediments of the sea, at the time of its retreat; so that the surface, which extended from the summit of the Alps to the last chain of the Jura, may be considered as having presented or formed one entire, inclined, and irregular, or undulated surface,—though not, however, sufficiently irregular to prevent the sea, in one of its retreats, from carrying from the summit of the primordial chain the immense masses of granite or compound stones, &c. which it had, as it were, detached, and then deposited in the places where they are now found; or, in other words, where the force of impulsion, at first given by the current of the sea, was obliged to yield to that of gravity and friction.

Admitting, therefore, this supposition, the surprise ceases with respect to the finding such huge masses of primitive rock at so great a distance and elevation as they now are, and not only isolated, but absolutely lying on mountains so totally foreign to them in composition and structure, as the Salève, the Jura, along the lake, on the hills of Cerdon, before observed, and even in the neighbourhood of Lyons; for soon after, a number of valleys having been apparently formed by the crush of the vaulted roof of the before-mentioned subterraneous caverns, as also by the causes stated in the tenth article and following data, the greatest part of these same blocks were necessarily, or unavoidably, left on the summit of those calcareous mountains formed by the new-made

valleys: it is therefore no unreasonable supposition to conclude, that most of the valleys which terminate near the lake may have been thus formed, as well as the mountains of the extensive basin itself, to judge by the different directions exhibited in the strata of the mountains which now skirt it on all sides, as also by their structure, abruptness, and the enormous calcareous rocks which cover their basis,—in fine, by the very great analogy that exists in the construction of most of the hills, which serve as its internal dike.

From these suppositions and facts, I am therefore again induced to conclude, that the lake may have once formed an extensive cavern, or caverns, of which the vaulted roof suddenly gave way, from some of the causes before mentioned, or else by the expansive force of a fluid, occasioned by some subterraneous fires; for, as already noticed, all bodies expanding with heat, and the limits of that force of expansion being there undetermined, it gradually increased, until it became superior to the incumbent weight of the vault, which it so distended as to occasion its explosion.

It is also probable, that the focus of these subterraneous fires may have lain between Evian and Lausanne, and that the seiches, or subterraneous air, before described, as likewise the water-spouts (electrical phænomena), which now and then appear on the lake, may be found to derive their origin from some remains of the same expansive fluid, which, even at the present epoch, still escapes from its deepest galleries or recesses, though covered by the detached fragments of the original vaulted roof, since imbedded in the successive sediments of the sea, after having precipitated itself into the new-created gulf. The same circumstances also appear to have given birth to the greater part of the inferior hills which screen the lake, and are entirely composed of primitive and secondary productions, united by a calcareous cement.

As to the lake itself, the form of which is at present that of an irregular crescent, it appears to have been originally (that is, at the time when the waters of the sea no longer covered the summits or tops of the Jura and Salève) that of a scalene triangle, of which the Jura might be considered as having formed one of the sides, tending in a direction nearly from south-west to north-east; while the mountains of Berne and Freyburg formed the second, from north-east to south-south-east; and those of the Salève, Voirons, and a part of the mountains in the duchy of Chablais, the third, from south-south-east to south-west.

There is also every reason to suppose that the Rhine, at that remote period, may likewise have served as the drain to that extensive lake, and that the two valleys

belonging to the Arve and the Rhône were the channels through which the sea made, in process of time, its way from the high Alps, during one of its retreats. The *bouleversemens*, or irregular appearances, which now exist in the interior of those valleys, seem strongly to corroborate this supposition, as well as the abrupt state of the strata of the lateral mountains, their wide fissures, and the immense pieces of rock that now lie at their basis; in short, the heterogeneity in their structure in general—all seem to demonstrate that they really owe their origin to the causes suggested in the tenth and subsequent articles.

The sea having then, in consequence of its gradual retreat, left uncovered that large or extensive tract of country situate behind the Jura, and between the Jorat and the Rhine, with a few lakes dispersed in the hollows, of which some still exist, as the Joux, the Morat, that of Neufchatel, Bienne, &c. it may be naturally supposed that it remained for a length of time in the extensive basin which then formed the lake (which was even so large as to extend from the Salève to the Jura, and from Mont Sion to Mont Jorat, &c.), and, likewise, that it remained to a considerable height, considering the extreme elevation of those mountains. Nevertheless, it appears, that by some internal commotion, operating in that part of the Alps, the Jura suddenly severed from top to bottom, and formed the defile of Cluse; that, in consequence thereof, the waters of the lake threw themselves into it with extreme violence, furrowing to a great depth, in process of time, not only the sides of that mountain, but those of the Vouaches, leaving them in the state we now see them,—carrying likewise away, by their weight and velocity, the large and immense pieces of rock which had detached themselves from those mountains at the time of their separation. Thus was prepared the *Perte*, or Loss, of the Rhône, which is visibly formed by those same fragments, and thin calcareous strata (produced by the sediments of the sea at the time of its accidental retreat), which bodies have since been, in great part, covered by a quantity of fragments, successively brought down from the primitive mountains by the waters, and now absolutely form the hills at the basis of the Credo, in the vicinity of the *Perte*: for these waters, at first so long restrained, as already observed, finding at once an aperture, flowed with such impetuosity, that, deeply furrowing the bottom of the bed of the lake, which was, as I have before said, as high as are at present the hills of Coligny, Labatie, and St. Jean, traced a number of valleys, which afterwards gave birth to those beautiful hills now nearly contiguous to the lake, which time, and the culture of

the first or original inhabitants of the country, have since brought to their present state of perfection.

Thus have I concisely stated my ideas concerning the original formation of the Lake of Geneva, including the valleys which terminate in its vicinity,—ideas which I really consider, in a great measure, to be equally applicable to the formation of all other similar extensive basins, and in general to most of the valleys in the Alps or primitive chain. Many other interesting facts, or data, might also have been added to the above remarks, had I not been fearful of becoming tedious, by dwelling too long on a subject which can be interesting only to naturalists and philosophers. I shall however venture to annex some few observations relative to the principal mountains that screen the lake, beginning with the Salève.

This mountain, which is situated south of Geneva, in a direction tending nearly from north-north-east to south-south-west, is one of the most curious of those which now shelter the lake, and is well worth the investigation of the naturalist, both on account of its abrupt state, and the naked strata, which at once show their difference of structure and direction, and on account of a deep and wide hollow, which forms on its summit the delightful Vale of Monetier, which divides the mountain into the great and little Salève.

The strata of the great Salève are nearly parallel to the horizon, and those of the little Salève so extremely inclined, that they appear to lose themselves in the earth, and seem exactly as though the mountain had been broken where the valley now is, by the sudden sinking of the vaulted roof, or by the operation of some subterraneous explosion, and subsequent falling in of some subterraneous cavern, into which sunk the extremity of the little Salève,—a circumstance which may probably have given the strata that inclined direction, so conspicuous on that side of the mountain, and likewise formed the valley itself. For a further explanation of this subject, see the Author's *Maritime Alps*, page 53, fig. I. and II. where the causes which may have produced the various directions exhibited by most of the beds or strata of the secondary and tertiary mountains are fully detailed.

But what, in this instance, appears forcibly to prove that the great and little Salève originally made one and the same mountain, is the great analogy of strata, similarity of structure, and relative thicknesses which exist between them, containing also the same species of fossils, &c.

The side of the great Salève next to the lake is however much more furrowed and chamfreteed than the little one; and the furrows, which may be deemed extremely curious and singular, are for the most part horizontal, being, in general, about one foot and a half in depth, and about four or five in height. These dimensions, nevertheless, gradually diminish, as the furrows get nearer the foot of the mountain: the interior part of them is also much polished, and their salient or projecting angles much rounded,—in this respect greatly resembling those which I have since had an opportunity of observing in the two calcareous mountains near Yenne in Savoy, which, in that spot, serve as a barrier or dike to the canal, into which the Rhône flows with great impetuosity.

Unable to account for that extreme polish in the above-mentioned furrows, except by the effect of a continual friction, it may be reasonably presumed that they owe their origin to the work of some rapid current which existed after the first retreat of the sea, or else at the period when it had retired from the summits of the Salève, the Voirons, and the Jura. Monsieur de Saussure, in his *Travels in the Alps*, lib. I. cap. VII. has given so minute, and, at the same time, so interesting and instructive a description of the first of these mountains, that nothing more on that subject is left for me to add; for I must own, it is in consequence of having read his scientific work that I have been aided in the observations since made, when at different times I have had an opportunity of visiting so interesting a spot,—and that my conjectures on the origin of the lake, and the commotions experienced in that part of the Alps, though at a remote period, have been greatly strengthened.

As to the Valley of Monetier, which is fifteen hundred feet above the level of the lake, it invites the botanist to it by the number and variety of Alpine plants which there grow promiscuously,—and the lithologist, by a quantity of fragments from the primitive mountains, mostly granite, scattered in this region. But what again appears more surprising, are the different strata of sand and pebbles conspicuous in several parts, which seem not to leave a doubt that this valley may once have likewise served as a drain to the sea at the time of its retreat,—a supposition still further corroborated by the number of horizontal furrows at present existing in the head of the little Salève, which serve, as it were, for a barrier to the valley.

In ascending from this gorge to the great Salève, which is considerably higher than the other, stands an immense piece of granite, of twelve hundred and fifty cubical feet,

of a similar kind to those which form the primitive chain, lying on calcareous strata, at the extreme height of eighteen hundred feet above the surface of the lake : and again, nearly on the summit of the same mountain, at no great distance from the *chalets*, or dairies, I found, at three thousand feet above the same level, another piece of similar kind, with very little difference from the former, as to bulk or size. Now, from the major part of these stones having their angles rounded, my hypothesis becomes more forcibly strengthened with respect to the manner in which those bodies have been conveyed to the places where they are now found ; for, had they been thrown there by volcanic operations, their angles might, in all probability, have been irregular, but surely not worn by the effect of friction,—neither would the surface of the Salève have been so furrowed as it is in several parts, which doubtless, as before observed, is the work of some rapid current.

These circumstances being duly considered, it may be concluded that my suppositions are in fact less hypothetical than at first sight appeared, since the southern part of the Salève inclines considerably, forming on that side a deep sloping valley, whereas the one next the lake has its strata much raised and abrupt,—which, added to the excessive declivity of the little Salève, is a further proof that the whole of the mountain has doubtless experienced various convulsions at different periods of time, and that its strata, now so abrupt on its north-western side, originally extended considerably towards the Jura. To this mountain, according to all appearances, they most probably communicated prior to the formation of the lake,—that is, before the sudden sinking of the vaulted roof of the cavern or caverns, now occupied, or filled up in part, by the lake itself. From these various circumstances, it may certainly be inferred, that there was a time when the strata of the Salève extended or projected much more towards the north-west than at present, as the perpendicular chamfretings, and the irregular forms so conspicuous on the same side, clearly evince, as well as the enormous stones, or rather immense rocks, now seen lying at its foot, resting against its basis to a considerable height, which in many parts even exceed one thousand feet. The thickness of these rocks, their structure, their direction, and the different species of fossils therein imbedded, &c. tend still further to show that they doubtless, at one time, not only formed a part of the same mountain, but likewise even a part of the vaulted roof which covered the cavern or caverns : for there is every reason to believe, from the calcareous matter found in their vicinity, as also from the white sand-

stone, with calcareous cement, lying in different places at their basis, composed of the same species of white sand found on the summit of the Salève, in strata of two or three feet thickness, that the rocks which now appear as though shooting out of the ground, and resting against its basis, are a small part of the total mass only, the rest having since been covered, or entirely buried, by fragments of the same mountain and successive sediments of the sea.

Finally, there can remain no doubt of the great revolutions and commotions of Nature experienced in that mountain at a date much anterior to the one which has given it the form it now has, if those parts contiguous to the villages of Collonge and Le Coin be attentively examined. There immense fragments, formed by a number of huge rocks, are conspicuous, which, by their mass, literally appear like small or lesser mountains, placed at the basis of the Salève: many of them, which are of a pyramidal figure, are upwards of three hundred feet in height. But what appears more surprising, and again more forcibly corroborates my idea of the severing or breaking of the mountain, is the wide and deep fissures which exist in that part of the Salève, and reach from the top to the bottom, with an opening of nearly from two to three feet at their entrance, besides caverns, which apparently extend far into the interior of the mountain,—among which are those of Balme and Orjobet: in short, the perpendicular pits, and many other objects similar to these, equally curious and interesting to the lithologist, not only prove the effects and havoc of some violent *débâcle*, but likewise those of an impetuous current, whose direction tended from north-north-east to south-south-west.

If the Salève be considered as abounding with curious and singular appearances, the Jura may also be deemed no less deserving of notice, as must clearly have appeared when speaking of the Dôle; therefore, that I may not enlarge too much on a similar subject, I shall briefly mention what will be most necessary to support my hypothesis,—I shall confine myself to describing the direction of its strata, which are invariably so inclined on the side next the lake, as well as towards the north-north-western, that if it were possible to see or examine the section of the mountain itself, those same strata, which almost touch at the summit, would be found resting on the nucleus of the mountain, diverging so considerably as to form a true Greek lambda (Λ), the top of which would very nearly represent the summit of the Jura.

It may however be proper to remind my reader, that I mean to be understood as speaking only in general terms of the strata of that mountain, having before noticed

that it would be impossible to enter into a minute detail on the subject, owing to the great irregularity and heterogeneity of the mass. But as the nucleus of the Jura is visibly of the secondary class, although of calcareous species, the strata above mentioned may be considered in great part of the tertiary, from their containing fossils. It is consequently my firm opinion, that they doubtless are of posterior date to the formation of the nucleus, and that they cannot have taken their present direction, unless by some great operation of Nature, which, from their original horizontal surface, has forced them, by some sudden sinking of the earth, to become as inclined as they now appear. Hence I have also been led to infer, from the extreme irregularity and confusion in their direction, which in some places exhibits vertical forms, and in others zig-zags, and sometimes seems even to describe a portion of a circle,—as likewise from the caverns found in the interior of the mountain, the calcareous matter which in many places covers the summits of the Jura, as well as the monticules, or small hills, on its sides and basis, that several of these strata at one time communicated with those of the Salève, and that, from every appearance, the change in their original direction to the present may be reasonably presumed to have happened at the epoch when the sudden crush, whether by external pressure, or internal expansion of ærial or igneous fluid, of the vaulted roof that covered the immense subterraneous cavern or caverns, since forming the Lake of Geneva, took place; for the above thin irregular strata, filled with marine fossils, and the hills which now lie at the foot of the same mountains, wear visible marks of having been the last works of the sea.

Besides these instances, many others might be enumerated, which are as curious in themselves as they would be interesting to the geologist; as, for example, 1st, the variety of species of sand-stone, as well as beds of sand and pebbles, found on the Salève and the sides of the Voirons; 2dly, the pyramidical form of the Môle, another stupendous mountain, which has also every possible appearance of having likewise been the work of some rapid or impetuous current, which has, as it were, sharpened its summit, given to it that regular slope next the lake, and extreme abruptness on its southern side; 3dly, the apparent analogy which exists in both the structure and formation of the mountains of Sion and Jorat, which seem to have also been the drain of that extensive lake; 4thly, the different species of gypsum found along the banks of the Rhône and near the hills of Cologny, which may be entirely attributed to a mixture of calcareous and vitriolic earths, kept originally in a state of dissolution by the sea; 5thly,

the existence of coal-pits on the Salève, contiguous to the valley of Monetier, though in truth not extensive; 6thly, the salt-springs at Bex and Aigle, which are again evident proofs that the sea, beyond a possibility of doubt, once covered that part of the Alps, and that, from having at its last retreat gradually evaporated, it doubtless left, in several places, different masses of marine salt, some in gems or *sal gemmæ solidum*, and others in fossils, mixed with selenitous earth, which in all probability have, in process of time, given birth to these saline springs; finally, the bank called Le Travers, in great part covered with sand and pebbles, as noticed in the description of Geneva, and situated in the lake, at about a quarter of a league from the harbour, I likewise consider as the remains of the vaulted roof which covered the identical subterraneous cavern or caverns, now replaced by the lake,—and which having since been re-covered, as well as the rest of the gulf, by the successive sediments carried from the summit of the Alps by the sea, as well as by rivers, the bed of the lake has, in length of time, been formed nearly as it now is; but that the bank itself, having in its principle a greater elevation than the other part of the bed, has consequently continued to preserve it.

Knowing of what importance to geology such hypothetical reasonings may be deemed, I must freely acknowledge that they merit a more extensive detail, strengthened by a greater number of facts and data than the plan of the present work will admit; but as I have already noticed that to be my intention at a future day, in an Appendix, I now only wait for the completion of my *Tableau des Alpes*, and again to re-visit the Cottian Alps (which I am now on the point of doing), in order to make new observations, and accomplish my promise.

Should I however be found, by the above remarks, to have in any degree contributed to the entertainment or instruction of that class of readers for whom this chapter has been written, I shall think myself abundantly rewarded.

DESCRIPTION OF VILLENEUVE,

INCLUDING THE

LOWER VALLEY OF THE RHONE.

ARRIVAL AT MARTIGNIE.

VILLENEUVE, the town next to Chillon, of which a description was given in a preceding section, has very little to recommend it, except its situation, which, being exactly at the extremity of the Lake of Geneva, and at the entrance of the Valley of the Rhône, must always make it delightful. Having also been the *Penni Lacus* of the Romans, it may with truth be said to vie in antiquity with most of the cities and towns in its environs,—a circumstance which serves to render that part of the country extremely interesting to both the historian and antiquary, since at Chatellard, a village a few miles from the former, many antique fragments of great taste are still extant, among which are some marble columns, and a beautiful mosaic pavement, well preserved,—and again, at a short distance thence, nearly below the château of Blonay, in the neighbourhood of a sulphureous bath or fountain, numbers of Roman medals and coins have been dug up.

The town of Villeneuve is badly constructed; but still, as there prevails here the same cleanly appearance so conspicuous in most of the Swiss towns, the irregularity of the streets and buildings is in some measure compensated, and rendered less unpleasant to the eye than it otherwise would be.

The public edifices are few; and indeed the only one worth seeing is the hospital erected in 1246, by Amadeus V. count of Savoy. The town has some commerce in silk, hemp, cotton, and cheese, which is carried on by commission: and, besides this manner of transacting business, the inhabitants turn to profit their right of fishing on the lake, as considerable quantities of trout are annually caught near the beach, and, being highly esteemed, are disposed of to great advantage.

Naturalists, who purpose visiting this part of the Alps, ought by no means to omit examining the land-accumulations formed by the Rhône at its entrance into the lake, which are continually upon the increase, as they will by this excursion be enabled to form a just idea of those which invariably exist at the mouths of all rivers, whether they throw themselves into seas or into lakes. They will likewise perceive, that those accumulations may reasonably be considered as nothing more than true alluvions, or a kind of mud-banks, formed by the successive sediments of rivers, which the greater or lesser degree of undulation of the waters of the sea or lakes (it matters not which) obliged those rivers to deposit near their banks. Hence I have been led to believe that the continents continually, though imperceptibly, encroach on the surface of the waters,—which circumstance can however only be properly said to affect lakes and inland seas, as the Mediterranean, &c.

The land-accumulations of the Rhône, contiguous to its running into the lake, are considerable, visibly extending five miles from north to south, and three from east to west, and, like those of the Po, are totally composed of fragments from the primitive mountains, intermixed with quartzose strata of fine sand, and particles of mica and argil, of different colours: they likewise, from every appearance, seem to have formed the major part of the lower valley, or the whole tract of country which stretches to the village of Grand Colombier, in an extent of more than fourteen miles in length. This is not only evident from the structure of the spot, its plane surface, and the various islands formed in the interior of the bed of the Rhône, but is further strengthened by geographical evidence; for the village of Port Vallais, or *Portus Valesia*, now five miles from the lake, was originally considered as one of the principal ports or harbours of the Nantuates, a people who anciently inhabited that part of the Alps; so that, though the lake at present bends more eastward than westward, there is every reason to presume that this curve is considerably decreased from what it was at first.

The Rhône, after having thrown itself into the lake, retains, for a considerable extent, its greyish earthy colour, owing to the variety of clay and argillaceous matter through which it passes; but as there is a vulgar error, which some travelers may have been induced to credit, that in its progress through the lake it flowed without at all mixing its waters, and kept, as it were, to itself, I think myself bound not only to notice, but indeed to contradict, such an idea. At no greater distance than four miles from the mouth of that river, it is impossible to discover the least difference in their

waters; besides, the appearance at the draining of the lake, which takes place near Geneva (again called the Rhône), sufficiently proves the contrary, the transparency of the river being there equal to that of the lake.

But to return to Villeneuve:—the high road from hence passes through La Roche, at about three miles distance, a village in which most commonly resides the magistrate to whom the senate of Berne confides the care or superintendence of the salt-works which are near it, and the spot where the great Haller, from having been appointed to that office, remained some years, and completed, during his residence, his great work on Physiology, the History of the Swiss Plants, and some others. The inhabitants of this village may be considered as being almost all marble-cutters, owing to the many valuable quarries of that species of stone which abound in the environs,—for vast quantities of beautiful and ornamental sculpture, if they may be so called, are exported from hence, and sent even as far as Lyons, a distance of near one hundred and thirty miles.

No sooner had I quitted La Roche, than the road led me by the basis of an abrupt rock, consisting of different-coloured marbles, which projects considerably into the valley. The most conspicuous kind appeared to be streaked or mottled with red, white, and grey; and I even observed, in the same species of stone, a number of fossils, or rather petrifications, imbedded in it,—for the animal, in this kind of matter, seems totally changed, and becomes susceptible of taking the same polish as the other part of the marble. The petrifications which I mostly noticed were *exuviae* of *madrepore* and *pectinitæ*; but the sides of the rock, though more particularly its northern one, are in several places covered with calcareous strata, similar to those of the Jura. From hence to Aigle, which is computed to be about one league, or three English miles, the road is rendered interesting by the curious and singular form and direction of the strata of the mountains, which there screen the valley, both on the right and the left, as likewise by the heterogeneity which exists in the major part of their mass and structure. But a circumstance, among others, which much surprised me, is, that though their nuclei appear to be of similar species to those of the Salève and the Jura, and do not, of course, contain fossils, in the upper stratum of these mountains vast quantities are found imbedded.

The town of Aigle is delightfully seated at the basis of a succession of fruitful hills, rising one above the other, forming a noble amphitheatre on the eastern side of

the town, and displaying an appearance of fertility both cheerful and romantic. This town is at present accounted the capital of a government, from which it takes its name, composed of four departments; for which reason it is not considered as making a part of the Pays-de-Vaud, or Pays Romand, but of the Pays Allemand, or Germany. The senate of Berne send hither a governor, every six years, to administer justice, as in their other bailiwicks. The Bernese have been in possession of this government for nearly three hundred years back, at which period it was taken from the House of Savoy, to whom it had belonged in full sovereignty ever since the year 1076, the time at which it had been ceded to them by the emperor, Henry IV. Its inhabitants enjoy many privileges, granted by the senate. Each department has likewise an exclusive right to exercise, in its own particular district, the police and inferior jurisdiction; and their councils, in general, consist of twelve members, chosen from among the inhabitants by a majority of votes, presided by the châtelain.

This province or government, which does not exceed eighteen miles in length and fifteen in width, is extremely fruitful, for corn and vegetables are cultivated in great abundance, the fruit is excellent, and the wine made on the spot esteemed good; in fine, most of the productions congenial to the south of France are to be met with here, as well as those of the frozen climate or region of the Alps, though standing only in lat. $46^{\circ} 12'$, and long. $7^{\circ} 7'$. Besides the above advantages, which enable this province to furnish its inhabitants with the first necessities of life, it also contains within its mountains and valleys a variety of curious productions, belonging to the three kingdoms of Nature; which circumstance, most probably, induced the celebrated Haller to reside here for some time.

Among these productions, the mineral are the most various and valuable, consisting, as before mentioned, of beautiful and different-coloured marbles, selenitic spar, gemmæ of salt, lead-mines containing particles or veins of silver ore, others of fossile-coal, as also virgin sulphur of the purest kind, found, as it were, incrustated in the rock; several kinds of copperas pyrites; and, lastly, salt-springs, from which the government of Berne has drawn, and still continues to draw, a considerable profit.

The one contiguous to the village of Panex was discovered in 1554; but it was soon after buried, and for a time totally lost, by immense rubbish or fragments belonging to the mountain of Yvorne, which, in 1584, suddenly gave way and fell, in consequence of an earthquake, which was so fatal and tremendous, that several villages were like-

wise destroyed by the ruins, not only of the same mountain, but of others in the vicinity, which experienced the same shock,—a catastrophe which, according to the tradition of the people of the country, lasted two days and a half. One thing, however, worthy of observation, is, that this part of the valley of the Rhône is subject to frequent succussions of the earth, and that, during the last earthquake at Messina, in the month of February, 1783, the shock experienced in that chain of the Alps nearest the valley was very considerable.

Nevertheless, if what I have advanced concerning the formation of the Lake of Geneva be duly considered, the inference deduced from it must assuredly be found to account for that circumstance, it being extremely probable that the focus of the present existing volcanoes may have deep subterraneous galleries, which still communicate, at a vast distance, with others which are either in force or extinguished: and as a further proof of the probability of this conjecture, on the 1st of November, 1755, about ten in the morning, the time of the earthquake so fatal at Lisbon, in the mines of Haycliff and Ladywash, at Eyam in Derbyshire, the rocks which surrounded the miners were so much disturbed, that soil, &c. fell from their joints or fissures; and they likewise heard violent explosions, as it were of cannon.—See Whitehurst's Inquiry into the original State and Formation of the Earth.

The springs which are in the vicinity of Bevieux, a village situate more towards the south, were not known till 1591; but being also entombed beneath the rubbish of the neighbouring mountains, though not from a similar cause with the former, these having been hurled or carried away, and then left by the velocity or impetuosity of the torrents in one of their risings, they remained totally concealed till the year 1674, when, after much labour, time, and perseverance, they were again recovered. Since that time the proprietors spared neither pains nor expense to guard them from similar misfortunes; and, to secure them more effectually, they caused the salt water to be conveyed by means of large tubes or pipes as far as Bevieux, nine miles from Bex, another village remarkable for its situation, as well as being in the proximity of the salt-works.

The government of Berne, at all times attentive to the happiness and prosperity of their country, began to be sensible of the value of such a discovery, and the great advantages which would naturally result from it, and agreed to purchase them of the original proprietors for the sum of £.103,493. This sum was extremely inconsiderable for such a treasure, considering the vast difficulty the Swiss before had in procuring salt,

from being at so great a distance from the sea, and the unavoidable consumption of that article throughout the country, both in making their cheese, and giving it to their cattle, which, strange as it may appear, they literally do, three times a week. These springs, being now the property of the state, the government has neglected no means of improving; and indeed so fortunate have they been, that the original expenses incurred for that object were crowned with success; for they were soon after found to yield upwards of 38,000 quintals, or hundred-weight, of salt per annum. The desire, however, of ameliorating them still more, having tempted the senate, about the middle of the present century, to adopt the plans of some foreign mineralogists, they were induced to dig deep and extensive pits, in order to augment, if possible, the volume of salt water; but, instead of the prodigious advantages which had been expected, it was soon perceived that they had been ill advised; for on the contrary, instead of gaining, they were literally decreasing, and, in fact, they yielded scarcely more than half the former quantity: so that, even during monsieur Haller's superintendence, the spring of La Providence, accounted one of the most abundant, yielded no more than nine hundred and thirteen pounds of salt water per hour, or about eleven pounds and a half of salt per hundred,—which diminution still continuing, the whole produce of the springs is at present calculated to be but about two thousand five hundred pounds of salt per day only, or nine thousand one hundred and twenty-five quintals per year.

Besides these springs, with their different pits and galleries dug in the interior of the mountain, which will be further described, the buildings of graduation, or those which serve for evaporation, including those for boiling the brine, and the magazines for depositing the salt, all known by the appellation of salt-works, deserve every traveler's attention: those for the evaporation I particularly recommend, as being both curious in construction and mechanism. The salines at Aigle, although deemed to be kept in better order, are certainly not so extensive as those at Bevieux; but the form or construction of the building is that of an immense gallery, fifteen hundred feet long, fifty wide, and forty-five high. The centre of this gallery is filled with small faggots, laid with care on timber-frames joined together, not unlike a scaffold; upon these faggots the salt water gradually falls, pure as it comes from the source or spring, by means of pumps, put in motion by a wheel of thirty feet in diameter, which is turned by a current of salt water. The saline water being thus, at different times, or repeatedly, made to fall on the faggots through which it filters, it not only, in a great measure, insensibly gets rid,



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by effect of evaporation, of most of its aqueous particles, but also the earthy and mineral parts, which were in a state of solution, and which gradually attach themselves to the faggots.

The water being thus reduced, by the above process, into brine, is then conducted into the building which contains the coppers or cauldrons, where the fire completes the evaporation of the remaining aqueous particles which it may have retained, and forms a pure saline crystallisation, of which a part again undergoes a further process, in order to be made clearer, or more refined, previous to its being deposited in the magazines. N° XVIII. gives an accurate representation of those buildings. But to those who may be desirous of meeting with a more ample detail on the subject, I would recommend the perusal of a work by M. Haller, entitled, "*Déscription abrégée des Salines d'Aigle: Inverdun, 1776.*" As for the works which were constructed at the adoption of the new system, with a view of increasing the volume or quantity of salt water, let what may have been their success, they still ought to be considered as doing great honour to the state, in their desire of promoting whatever might be deemed a benefit to the country.

The philosopher, who may have the curiosity to explore those gloomy abodes, and extend his visit not only to the bottom of the pits, but even to the galleries, which may be said nearly to pierce the mountain from side to side, will find a multiplicity of objects worthy of remark, both from the extraordinary and singular structure of the mountain itself, and from the arrangement and direction of its strata, &c. These galleries are cut out of the solid rock; and some, which are more than a mile in length, meet in the centre of the mountain. But what is yet more remarkable, and indeed astonishing, is the various kinds of reservoirs constructed in the interior of the rock, hewn out of the main stone: some of them contain the salt water, previously conveyed thither by means of pumps, and the others fresh, for the purpose of turning another large wheel, of six-and-thirty feet in diameter, that puts the pumps in action, and is fixed at the bottom of a pit six hundred feet deep. The one which I explored, called du Bouillet, is reckoned six hundred and seventy-seven feet deep, and contains forty-nine ladders, of eighteen steps each, supported by forty-eight wooden-platforms. Thus did I descend to the very bottom of the pit, with an intention of trying some experiments on the temperature of the interior of the mountain, carrying with me a lamp and a proper apparatus for that purpose, and being dressed in a coarse habit, on account of the slimy drippings which fall from every part of the pit. Having gained the depth I was

desirous of reaching, I ventured to try my experiments, which I found to be nearly the same as those made by monsieur de Saussure, some time prior to mine; that is, the heat at the bottom of the pit, which was sixty-three degrees and a half above 0, by Fahrenheit's thermometer, surpassed that of the medium temperature at the surface, all round the globe, by about seven degrees and a half,—a circumstance which would astonish, or appear singular, were it not known that this part of the Alps contains vast quantities of pyrites, or sulphat of iron. As for the structure or arrangement of the mountain itself, it may be considered as circumstanced pretty nearly as follows:—First, that the summit, or external surface, is of gypsum, the most predominant colour of which seems to be greyish, though there are some white, and others inclining to red, but in general without much coherency; the red is likewise intermixed with a species of marly earth, which crosses, in every direction, in wide veins or streaks. Under the gypsum, also, lies a kind of soft or tender sand-stone, striated with gypsum, sand, and argil; and though this species of stone cannot be considered as very hard, yet does it not admit the water to penetrate, or filter through, on account of the argil. And, lastly, I consider the nucleus of the mountain to be formed of a kind of argillaceous earth, containing iron, mica, and some particles of gypsum,—its colour being a greyish black, inclining to blue. It is out of the nucleus that the saline springs take their source; and in the interstices of that kind of stone are found the pieces of crystallised salt, or gemmæ, which the people of the country offer to travelers.

From Aigle to Bex, which may be about four English miles, the high road continues the whole way along the bottom of the valley. The mountains which skirt it on both sides are in general calcareous, though their bases are, for the most part, covered by hills of gypsum. Before arriving at Bex, I visited the church of Ollon, purposely to see a column, or kind of Roman mile-stone, which has the following inscription: "CLAUDII VALLENSEUM OCTODURUM," with the Roman cipher "xvii," which is the exact distance, reckoning by miles, from Martignie to that village. I likewise passed by the singular and extraordinary hills of Champigny and Triphon, which may truly be deemed such, from their extreme elevation, and their standing isolated, as it were, in the centre of a plain, which in that part literally forms the bottom of the Valley of the Rhône, as also from the circumstance of having nearly the whole of their mass formed of a hard calcareous stone, similar to the kind which forms the nuclei of the Jura and the Salève, and, like those, equally without fossils. I however discovered, on the side of



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the Triphon, near the village which takes its name, a quarry of beautiful marble, partly covered with a yellowish calcareous stratum, in which was contained a quantity of marine fossils, among which the bivalves were most numerous.

The town of Bex is ancient; but from its being, as before noticed, delightfully situated, and at no great distance from the salt-works at Beviex, strangers desirous of visiting them are thence induced to make it their place of residence for the time.

Provisions being likewise excellent, and at a moderate price, many old Swiss officers, retired from the service, live here with their families, and greatly contribute towards rendering the society of Bex extremely pleasant.

The distance from hence to the frontiers of Berne, which does not exceed three miles, may be said to offer, if not nearly the whole way, at least at intervals, prospects of great beauty, though the valley continually contracts, and the mountains gradually rise to such a degree, that, at the bridge of St. Maurice (*Vide* N° XIX.), the Rhône totally fills up the valley.

Having there crossed, by a small corps-de-garde built at the foot of the bridge, I found myself in the republican state of the Vallaisans, of which a small square tower indicates the limit, as seen in the drawing. This bridge is certainly of beautiful construction, and supposed by the inhabitants to have been built by the Romans,—a conjecture by no means improbable. It is formed, as represented, of one single arch, through which the whole of the Rhône flows with great rapidity and extreme depth, although it has dug this bed through a thick and wide calcareous stratum, the sections of which may be now considered as forming its barrier. The length of the bridge is two hundred and twenty feet, the opening of the arch about one hundred and sixty-three, and its form nearly that of a semi-circle.

The little town of St. Maurice, which guards the entrance of the Lower Vallais, and is indeed its capital, is situate between two high mountains, at the western side of the Rhône, and composed only of one long street, lined on both sides with handsome houses, which, at first sight, raises in the traveler an idea of its consequence, superior to what it in reality possesses. Its inhabitants, who are certainly less industrious than the Bernese, appear likewise to enjoy fewer comforts; an appearance which is diffused throughout that part of this republic, which is not considered as truly independent, but attached, as subordinate subjects, to the Upper Vallais, and of course excluded from having any share in their own government, although democratical.

The religion of the country being catholic, it truly appears, from their manner of acting, that the tender state of their consciences so entirely engrosses their minds, as to make them neglect every other consideration; for, in fact, never have I passed through the Lower Vallais, which has been often, without being obliged to fall into the suite of some sacred procession or other.

The town of St. Maurice may most assuredly boast of its antiquity; and though at present inconsiderable, was certainly very different in the time of the Romans, by whom it was known by the name of *Tarnade*, or *Tarnaie*, according to Antoninus; for that of Agaunum does not appear to have been given to it till after the massacre of the Theban legion, which took place the 22d of September, in the year 266 of the Christian æra. This legion, which some treat as fabulous, was composed, as is said, of six thousand six hundred catholics, who dared to refuse obeying Maximian, the Roman general, who commanded them to march into Gallia Narbonensis, to stop the progress of Christianity, and who, in order to punish that disobedience, first began by decimating them, and then concluded by a general massacre. Indeed some historians have supposed it given at that very epoch, from the word *agaunum*, deriving it from the Greek *αγών*, an appellation given by the Roman emperors to the victims sacrificed previous to their undertaking any expedition. This city has likewise been called *Fanum Sancti Mauricii*, after the chief of that legion, who suffered martyrdom with the rest of his companions.

Here is also a noble abbey, dedicated to St. Maurice, founded in 360 by Theodore, bishop of the Vallais; and an ancient inscription, still extant in the church-yard, which seems to have been addressed to the emperor Augustus by the Nantuates: so that this may literally be styled classic ground. In the church, near the altar, is a beautiful mosaic pavement, well preserved, and highly executed; as also three antique columns, of good proportion, and much taste. There have likewise been found, in the environs, many vestiges of antiquity, which sufficiently prove that the Romans, perfectly sensible of its important situation, to defend the Pennine and Lepontine Alps, had not only embellished, but fortified it, and made it one of their strong places or deposits of arms. At St. Maurice was also held the council of Hippona, where St. Augustin preached in the year 393; and there Rodolphus I. was crowned king of Burgundy in 888, from the Vallais being at that time considered as making a part of the kingdom. It afterwards passed under the dominion of the German empire, and to the House of Savoy, from whom it

was taken, in 1475, by the people of the Upper Vallais, aided by three thousand Swiss, who, on becoming masters of it, began to destroy the fortifications and châteaux heretofore belonging to the dukes of Savoy, and divided the province into seven bailliages, of which St. Maurice is the principal.

The republic of the Upper Vallais, which is entirely independent, and allied to the Swiss, being partitioned into seven departments (in German, *zindhen*), the government has settled, that each department shall send a bailiff, every two years, to govern the Lower Vallais; though it might probably have been more advantageous to the inhabitants of the latter, had the governor of the Upper Vallais followed, in that instance, the custom of the Bernese, and appointed the bailiffs for six years instead of two. The country of the Lower Vallais is certainly fertile, though it frequently suffers by inundations, caused by torrents which precipitate themselves from the summits of the Alps on the melting of the snows. The inhabitants cultivate saffron in small quantities, which they dispose of.

From St. Maurice to Martignie, a town seated nearly at the basis of the Great St. Bernard, the distance may be computed from ten to twelve English miles; but the road and the country are so varied, and the prospects so quickly succeed each other, that the distance appears trifling: and as it is not at present my intention to enter into a minute and lithological description of the various species of mountains which screen this valley, and form as it were its rampart, I shall merely notice, that there reigns, throughout, so great confusion and disorder in their structure and the direction of their strata, as well as extreme abruptness in their form, that, were we only to consider the above circumstances, they would be sufficient to evince that the valley cannot possibly owe its present state to any thing but causes similar to those mentioned in the preceding description, as there exists every visible appearance that it was originally a gallery to some subterraneous fires, the vaulted roof of which suddenly gave way, and the fragments have since been in great part covered by others from the primitive mountains, carried thither by the sea during its last retreat: but as for those in the neighbourhood of St. Maurice, they appear to be calcareous, or of the third order, having thick strata, and being wooded nearly to their summit. At three miles from the town, in the vicinity of the village of Juviana, I found myself entering among the primitive and secondary mountains,—these being mostly composed of a species of steatites, containing particles of quartz, mica, and feldspath, in thin strata, which easily divide into parallelopipeds of different

sizes, much resembling the German gneiss. The direction of those strata appeared to be nearly vertical, or perpendicular to the horizon, though every-where parallel to each other.

No sooner had I left this village, than I began to hear a loud noise of water falling among rocks; and, ere I had proceeded much further, discovered a beautiful cascade, precipitating itself perpendicularly from the summit of a stupendous mountain, which was on my right, about four hundred and sixty-two feet high. This water-fall, called by the people of the country *Pisse-vache*, and formed by the river *Sallanches*, seems to bear visible marks of having originally fallen from a much greater height, or about seven hundred feet, if we judge from the elevation of the lateral mountains which form the gorge through which the waters throw themselves, and which, according to appearances, seems to have been formed by their continual attrition. This supposition appears probable, from the quantity of rubbish and fragments detached from the same mountains, which now lies at the foot of the fall, and forms a hill of no inconsiderable height. The structure of the mountain, from which the water falls in a straight direction, is of similar species to the one near *Juviana*, with only this difference, that the strata are less inclined, and the colour of the stone darker; but as the water throws itself from such an extreme height, a great part is converted into vapour ere it reaches the bottom; and I have even remarked, without any considerable wind, the spray of the water thrown back, as it were, on the summit again, in the form of a cloud. At sun-rise there is always a rainbow at the foot of the fall, and indeed oftentimes two, or a double rainbow, of the most beautiful and lively tints,—a phenomenon doubtless owing to the great proximity of the aqueous globules, which reflect the beams of the sun so near the eye of the spectator.

This spot, to a studious or sentimental observer, becomes particularly interesting; and, from being solitary, naturally encourages the mind to meditate,—for there it may surely enjoy undisturbed calmness and serenity, unless aroused by the melancholy, though pleasing noise of the water. Yet to those who may not be equally disposed to admire such tranquil sensations, I recommend it as a place, above all others, calculated for the lithologist, or inquisitive traveler, from its proximity to the bed of the *Rhône*, which flows at no great distance. There he will not only find most of the productions of the High Alps, but be with ease enabled to minutely examine the various stupendous and abrupt mountains which screen the valley in an extent of seven or eight miles.

At one league from Pisse-vache I passed the torrent of Eaunoire, or Triant, on a stone bridge thrown across this torrent, which takes its source in a glacier of the same name; but the mountains which were on my right had wonderfully changed in species since my leaving the spot. At first they exhibited a kind of schistus, or rather horn-stone; afterwards thick strata of pudding-stone, of the primitive order; and then micaceous schistus, with vertical strata, which did not effervesce with acids; lastly, contiguous to the above bridge, I perceived an abrupt mountain of a most curious kind of sand-stone, of a deep grey colour, containing mica and a few particles of quartz: but what was more remarkable, were the several fragments or pieces of granite, in a concrete state, as well as schistus, horn-stone, and argil, which I found in it. To this succeeded another, resembling very much the one near Pisse-vache, except that its colour was lighter, and that it apparently contained a larger quantity of mica and feldspath. The torrent of Eaunoire, before flowing through the bridge, rushes with extreme impetuosity from a wide and deep fissure effected between two rocks, which appear originally to have made only one, but which has been separated by some local convulsion of the earth. The water, being thus so closely contracted, makes here a most terrific noise; which, added to the abrupt, and I may almost say the naked appearance of the rocks, where only a few scattered firs and pieces of moss exhibit themselves to the eye, give the spot a wild and tremendous appearance. These rocks may still be considered as being a species of gneiss, containing a great quantity of petro-silex, not unlike the mountain of Pisse-vache, though its strata are larger and more marked, and its veins of quartz thicker and more distinct. To these succeeds one of a kind of porphyry, in which is felspar, hornblende, trap, and argil; then come different beds of schisti, which stretch nearly as far as Martignie. At the distance of about two miles and a half from the former rock, I crossed, on a wooden bridge, the Drance, a river which takes its source at the summit of the Great St. Bernard; and there saw, with concern, that this river, in junction with the Eaunoire, frequently occasions very considerable damage to the inhabitants of the country, although the government has done every thing to prevent it, but without effect. The extreme velocity of those torrents, as well as the uncertainty of their beds, renders almost every preventive useless. On the opposite side of the bridge stands the small village of Basthia, built on the side of an abrupt mountain, composed of a blackish calcareous stratum, striated with white spath; and on the summit of the same mountain is an ancient tower, by many imagined to have been erected by the Romans, though more

probably the relique of some château heretofore belonging to the bishops of the Val-laisan country.

From the top of the mountain, the view of the course of the Rhône is both noble and extensive, including the side from which it takes its source to where it runs into the Lake of Geneva; for the town of Martignie, or Martignac, which is nearly contiguous, is, as it were, placed at the summit of the angle formed by the direction of the valley of the Rhône, whose opening may be nearly computed at eighty-two degrees, the source of that river being almost in a south-eastern direction from the town, and its mouth, or entrance, at the north-north-western.

Before I conclude the description of this part of the Lower Vallais, I must not omit noticing a melancholy infirmity, and, I may say, a woeful impediment to beauty, which affects a considerable number of the inhabitants, called the *goîtres*, which is an excrescence in the neck,—an appearance the most unsightly and disgusting that can be imagined. This is attributed, by many of the faculty, to a swelling of the glands; and by others to a tumor, or morbid swelling, produced by an almost total relaxation in the nervous system, or in the constitutions of the miserable beings who are thus afflicted.

But the cause of this evil is probably partly physical, and partly moral; and those which are the most afflicted are named *Cretins*. For a more complete account of this subject, see the works of Messrs. Haller, Tissot, and Graner.

These Cretins are positively in such a degree of brutishness, or mental imbecillity, that they not only are shocking to humanity, but fill the mind with sentiments of horror, combined with pity, at viewing a fellow-creature thus degraded and afflicted. There are some, even, who have this loathsome disease to such excess, that their *goîtres* hang half way down their body, so that it is impossible to discern the passage from the head to the body; others, again, have several of these swellings, joined or united, as it were, together, and are, if possible, still more hideous and disgusting.

These miserable beings have, in general, a yellow and sickly countenance; their flesh flabby and livid; the tongue extremely thick, so that they cannot articulate, but make a croaking noise; the features deformed; the eyes inflamed, with a look of languor and heaviness; walking with great difficulty, and so excessively indolent, that even in the absolute want of common necessities they require assistance, and oftentimes to be fed with a spoon, like a new-born infant. Those who are not so severely attacked, render themselves sometimes useful in menial capacities; and there have been instances of

their marrying, and children resulting from these marriages: but what is more remarkable, this dreadful malady seldom makes its appearance till the unfortunate victims (if one may so call them) are seven or eight years of age, and then it goes on gradually increasing till the age of puberty; for till then it is seldom known to reign to any violent degree. Some physicians have been led to attribute the origin of this complaint to the melted ice and snow, which the people of the country drink; others, again, to the selenitic and calcareous particles with which the water is impregnated; but many, I think, with greater appearance of probability, suppose it to be in a great measure owing to the noxious effluvia, which proceed from the marshes and swampy grounds that generally lie at the bottom of the deep valleys of the Alps, added to the want of circulation of the air, and the intense heat experienced during the summer-months, as at Maurienne in Savoy, the city of Aösta, &c. where that infirmity reigns. Monsieur de Saussure judiciously observes, that *göttres* are unknown in the Alps, wherever the elevation exceeds three thousand feet above the level of the sea. It may, however, be presumed that this complaint in some measure depends on the nature of the bodies of the individuals themselves, since, in the same valleys, they are not all equally affected. These poor wretches, with their deplorable appearance, are by no means mischievous; but on the contrary, meek and humble to an extreme,—for innocence and torpitude seem to be their chief characteristics. They are even, I may add, beloved, and waited on with care and attention by the rest of the inhabitants, who, from religious ideas, as well as from their natural goodness of character, consider these inoffensive beings as predestined by heaven to be guarded by that malady from sin and future punishment. I have often had occasion to witness mothers sending their children to help and comfort those who were incapable of doing any thing for themselves, telling them, at the same time—"They will pray for you, my children; and their prayers must be heard, for they are saints on earth." And thus the maternal mandate, dictated by religion and compassion, was no sooner issued than cheerfully complied with:—a forcible and convincing proof that true principles of religion (let that religion be what it may) not only wonderfully tend towards relieving our personal afflictions, but inspire us with the proper desire of pouring the balm of comfort into the wounds of the unfortunate.

their manner, and exhibit a tendency from these manners: but what is more remarkable, the checked melody seldom makes its appearance till the unfortunate victim is one may so call them) are seven or eight years of age, and then it goes on gradually increasing till the age of puberty, but till then it is seldom known to be in any violent degree. Some physicians have been led to attribute the origin of this complaint to the melted ice and snow, which the people of the country drink; others again, to the salt and calcareous particles with which the water is impregnated; but many, I think, with greater appearance of probability, suppose it to be in a great measure owing to the nature of the climate, which produces the menses and ovarian glands that generate it at the bottom of the deep valleys of the Alps, added to the want of circulation of the air, and the intense heat experienced during the summer months, as at Montevana in France, the city of Aosta, &c. where the tendency is more abundant to the complaint, than elsewhere in the Alps, wherever the climate is less temperate, and the heat less intense. It may, however, be produced in the most temperate climates, where the level of the sea is not, however, be produced in the complaint in some measure depends on the nature of the bodies of the individuals, and the heat of the climate, in the same valley, they are not all equally affected. The great weakness with which the complaint is attended, is by no means the disease, but the country, much and liable to an extensive and irregular system to be their chief characteristic. They are, however, I now add, robust, and want on with care and attention by the rest of the inhabitants, who from religion think it well to from their natural goodness of character consider these unfortunate beings as predestinated by heaven to be guarded by that melody from sin and eternal punishment. I have often had occasion to witness mothers sending their children to help and care for those who were incapable of doing any thing for themselves, telling them, at the same time—"They will pay for you, my children, and their prayers must be heard, for they are saints on earth." And thus the maternal melody, directed by religion and compassion, was no sooner issued than essentially complicated with a false and convincing proof that true principles of religion (that that religion be what it may) not only wonderfully tend towards relieving our personal afflictions, but towards the proper desire of pouring the pain of another into the wounds of the unfortunate.

DEPARTURE FROM MARTIGNIE.

DESCRIPTION

OF THE

NORTHERN SIDE OF THE GREAT ST. BERNARD.

ARRIVAL AT THE HOSPICE.

THOUGH the ancient city of Martignie be at present a very small town, consisting of one single street only, in great part built of wooden houses, it must not be forgotten that it is a place of great antiquity; for there does not exist the least doubt that, in the time of the Romans, it was of considerable extent, since it is well known that they established one of their colonies here. Its original appellation appears to have been *Vicus Veragrorum*, a principal town of the *Veragri*, a people who at that time inhabited this part of the Alps; and Cæsar, in his Commentaries on the Gallic War, calls it *Vicus Octodurus*. Pliny, likewise, in speaking of the privileges which this city then possessed, gives it the name of *Veragrum*:—"Sunt Octodurenses Latio donati." Pliny, lib. III. cap. XX.

There have also been found, in its vicinity, inscriptions, from which it seems to have likewise borne the name of *Forum Claudii*. Sergius Galba, Cæsar's lieutenant-general, is said to have fixed his winter-station near this city; and, indeed, a few vestiges of his encampment are still extant. Some historians have even supposed that the mouldering ruins of the tower before mentioned, seated on a rock at the eastern part of the city, had originally been of Roman construction. This supposition has an appearance of probability; first, from the pass being at that time much frequented; and secondly, from Cæsar's knowing the advantageous positions of Martignie and St. Maurice, with regard to defending the Pennine Alps, he had neglected nothing to increase their natural state of defence, which are nearly shut in by lofty mountains. As for the former of these towns, which is now, as I have before observed, very inconsiderable, it is not yet altogether

without trade, its situation being at the foot of the Alps, and at the entrance of the Upper Vallais. (*Vide N° XX.*)

Not far from Martignie is a glass-house, or manufactory, much esteemed for the good quality of its glass, in the composition of which is used a species of porous granular quartz, or *quartzum granulatum* of Wallerius, spec. 106, dug from a mountain in the neighbourhood of Lides, a village which stands on the road to the Great St. Bernard. As this contains great quantities of pyrites, and the above quartz is extremely porous, I have been led, by every appearance, to attribute these pores entirely to the decomposition of those same pyrites; having found, in several of them, vitriolic crystals of a bluish colour.

The country in the environs of Martignie is fertile, abounding in corn, fruits, and excellent wine, the produce of their vineyards. The low grounds are however subject to inundations, the Rhône frequently overflowing its banks, and doing considerable damage; so much so, that in 1596 the town was nearly submerged, and upwards of five hundred houses were at that time in great part washed away. It is at present considered as the capital of a *châtellenie*, or jurisdiction of a lord châtelain, belonging to the bishop of Sion, who sends hither a kind of governor, to administer, in his name, most of the civil and criminal laws.

With regard to the elevation of Martignie above the Lake of Geneva, it does not exceed three hundred and eighty-four feet; which very sufficiently proves the trifling declivity of the Rhône in that part, comparatively speaking, to what it has elsewhere; for, allowing the distance from that town to where the river flows into the lake to be computed nearly at thirty English miles, including the different windings of its channel, it scarcely allows more than twelve feet nine inches and a half of descent, or declivity, in a mile. It is however necessary to observe, that this declivity is not every-where uniform, being in some places greater, and in others less, according to the contraction of the channel.

On quitting this town, I continued, for some distance, the high road to the glaciers of Chamounie, and then turned off, in order to pursue that which leads to the Great St. Bernard, which soon brought me to La Vallette, the first village, where formerly were worked the copper and lead mines contained in the neighbouring mountains. From hence may be properly said to commence, though imperceptibly, the ascent of this formidable pass, which, in fact, continues for the space of twenty miles, the distance



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from Martignie to the Hospice, or convent of monks, seated on the summit of the mountain, being computed at twenty-four. The greater part of the mountains which screen the road from the valley of the Rhône to the other side of the last-mentioned village, appear to be of lamellated spathic rock, containing particles of quartz and mica, not unlike the *saxum mixtum spathosum* of Wallerius: but the hills are mostly composed of fragments from the primitive mountains, which seem to be no other than true alluvions, or mud-banks. I have however remarked, on most of their summits, large pieces of granite, or primitive rock, of which the rounded angles and polished surfaces sufficiently evince that they could only have been carried thither by the last retreat of the sea, and by similar means to those which operated in the transportation of the masses which now lie on the top of the Salève, &c. as before stated.

I then, at no great distance from the village of La Vallette, crossed the Drance (an extensive and rapid torrent, which runs through the valley), and entered a forest of fir, larch, and other Alpine trees. The high road, which here runs the whole length of the same valley, in a direction tending from east to west, is beautifully romantic, following almost every-where the course or banks of the Drance, which rolls its foaming waters in a deep channel, apparently, at first sight, furrowed in the rock by their impetuosity, if we may judge by the very great similarity existing in the opposite strata of the same rock, which are abrupt on each side, having a similar direction (that is, nearly vertical), also the same structure, and being almost every-where cut at right angles of equal heights, by deep fissures almost parallel to the course of the torrent. These are appearances which may be thought to indicate its original elevation. Yet, though I am not desirous of denying the possibility of such operations, it may be reasonably presumed that the first channel of the Drance was only a deep or large crevice effected in the side of that mountain, or rather chain of mountains, by some subterraneous commotion,—which cavity or crevice, in process of time, may have been filled with fragments brought away from the primitive mountains by the sea, during its last retreat; but that the torrent itself, having since (by the course or velocity of its water or current) carried those same fragments into the Rhône, the bed through which they flowed has thus gradually and imperceptibly lowered to its present level,—a suggestion which, from a careful view of the circumstances, I have been induced to adopt, as it appears the most likely to account for its being filled with such enormous pieces of primitive rock, which the waters were unable to carry off or wash away.

This rock or mountain, which seems to be of the compound order, containing quartz, mica, and horn-stone, is wooded to the summit, and has even some good meadow-land on it.

As the road approaches nearer to St. Branchier, a village seven miles from Martignie, I perceived that I was imperceptibly getting farther into the Alps; for the mountains became more stupendous, the air considerably rarer than in the plain, and the goitrous appearances much less frequent; and, in fine, I had already arrived at the zone where vines cannot grow. Nearly opposite stood lofty and majestic spiry rocks, in the shape of needles, serving as supports to the mountain, which contains, and in that part conceals, the great glacier of Triant; while, on my left, a range of hills, formed of fragments belonging to the primitive mountains, presented themselves to view. This circumstance did not surprise me, because the village of St. Branchier is seated at the junction of the extensive valleys of Bagnes and Entremont, and I have invariably remarked the same singularity in every part of the Alps,—it being a constant rule, that, at the junction of one or more valleys, hills of similar composition to the above are invariably to be found in their vicinity. This last village may be computed at fifteen hundred and eighty-five feet and a half above the level of the sea, and Martignie only four hundred and fifty-seven and three-quarters,—a difference which not only is extremely perceptible with regard to climate, but wonderfully influences the inhabitants themselves, who are infinitely more lively, affable, and good-humoured, than those of the latter, and answer more to the character given of the Vallaisans by Jean Jaques Rousseau.

On quitting St. Branchier, the ascent begins to be rapid, and the stones are so placed, in several spots, as to resemble a flight of steps, which, for the space of a couple of miles, is difficult and fatiguing, but afterwards becomes less inclined. The mountains, both on the right and left, vary in a remarkable manner, during that short distance, in colour and species, though the greater part are calcareous and lamellated, mixed with particles of mica, very like the calcareous *particulis scintillantibus* of Wallerius, spec. 42. In the neighbourhood of Orsière, a considerable village three miles from the former, the road is less rapid and more regular, and the valley in such a state of cultivation, as not to appear arid and unpleasant, though totally wedged within the midst of a stupendous pile of mountains. Its situation does not, however, admit of the culture of walnut-trees, which even begin to be less abundant at some distance

prior to reaching this village. It is certain that its height is considerable, and may be computed at two thousand eight hundred and nine feet and a half above the level of the sea, or three hundred and ninety-two more elevated than St. Branchier.

At nearly midway between the above-mentioned villages, I passed, on my right, the road which leads across the Col du Ferret (another formidable pass) to Courmayeur, a town situate in the valley of Aösta, which in that part continues along a narrow valley that tends in a direction from east to west. This valley, as well as the bed or channel of the Drance, is filled with immense pieces of granite, and different species of compound rock, having their angles rounded, and many of their surfaces very much polished,—a circumstance the more remarkable, as there does not exist a single mountain of granite in the environs, not even the Great St. Bernard itself, which is of a different species of rock, but which has nevertheless so far influenced monsieur de Saussure, by the extreme analogy in the composition and structure of those same masses with those in the environs of Martignie, and the granites which form the Col du Ferret, as to induce me to believe that they may be considered as owing their origin totally to fragments detached from that same Col, and that the narrow valley might be presumed to have been the road through which they were hurled from its summit at the last retreat of the sea. These suppositions certainly appear very probable, when it is considered that on the other side of Orsière those immense pieces of rock become less conspicuous, and above the village of Lides not any are to be met with. In the vicinity of the former, the lateral mountains again change, and appear to be nearly all composed of a lamellated calcareous stone, more or less mixed with mica, and strata nearly parallel. The valley here contracts considerably, and in many parts the road shelves, as it were, over the Drance, to a terrific height,—so that the traveler, who is unaccustomed to such scenes, must doubtless be filled with a mixture of terror and surprise, while following the different mæanderings, formed at an immense depth, and almost perpendicular, in the main rock, by the impetuosity of its current.

After six miles successive ascent from Orsière, stands Lides, a village much pleasanter than could be expected, from being absolutely seated between two ranges or piles of mountains, the most stupendous I ever met with, but which, from having their sides cultivated (producing not only corn, but vegetables, for the inhabitants, and meadows for their cattle), have really a beautiful effect. Nearly contiguous to this village I remarked a species of *lapis allaris* or *apyrus*, resembling the *lapis colubrinus*, the mel-

losus of Wallerius, spec. 137,—a stone which the people of the country make great use of for the construction of stoves, both for themselves and for exportation. It is of a dark green tint, but turns black by the effect of fire; and is so far found preferable to any other for that use, that it does not become red from heat, let that heat be ever so excessive; neither is it liable to fly or break as earthen, or even iron stoves, besides being accounted more wholesome for that purpose.

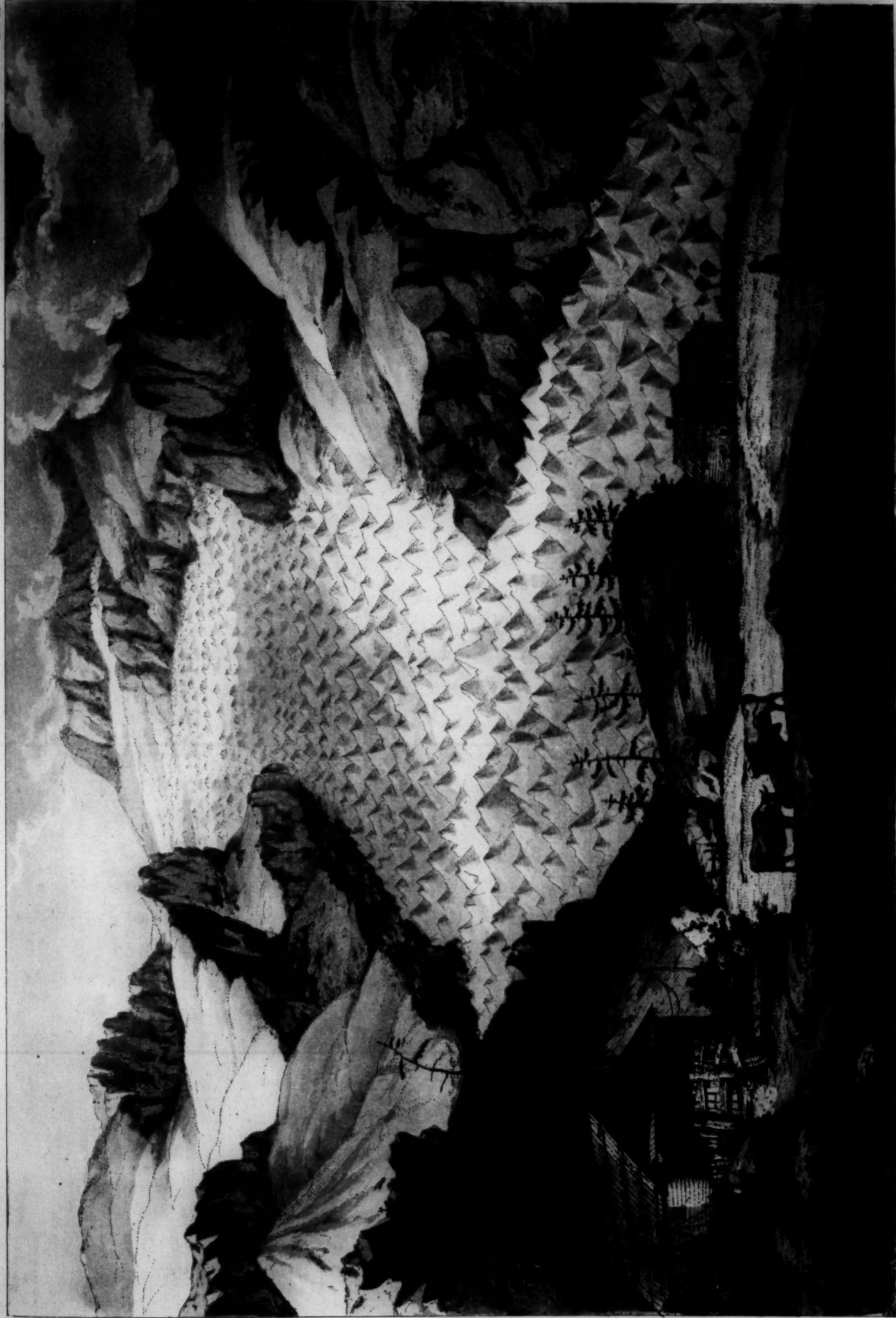
At the basis of a mountain near Lides, called La Tour, is a rich mine of copperas pyrites, intermixed with a kind of azure blue and *verd-de-montagne*, or *creta viridis*, two colours much used in painting *al fresco*, and of which the inhabitants send great quantities to Piedmont. Three miles from hence stands St. Pierre, or St. Petersbourg, the last Vallaisan village of any extent previous to entering the king of Sardinia's states. This village is defended, on the Piedmontese side, by a wall *à creneau*, or kind of battlement, as well as by a ditch, formed, as it were, by the torrent Valsorey, and is so extremely elevated, as to be five thousand four hundred and thirty-four feet above the level of the sea, and three thousand eight hundred and forty-eight higher than Martignie; so that the winters not only are intensely cold, but may be said to last nine months out of the twelve. Its inhabitants therefore, as well as those of Orsière, are obliged, on that account, to dry their vegetables on a species of *étendoirs*, or wooden frames, placed horizontally, and supported by pieces of timber, cut for the purpose, of ten or twelve feet high. They have also a singular mode of cultivating or propagating their beans (an article of great consumption), which is, that as soon as the plant is about a foot high, it is laid in the ground like the stem of a vine, when in a short time sprout out from the eyes or joints of its stem a number of branches, which soon acquire sufficient strength to resist the severity of the atmosphere, that reigns nearly the whole year throughout the Upper Alps. They pretend that this process both accelerates their maturity, and adds to their strength so considerably, that they are thus always certain of procuring a plentiful harvest of their favourite vegetable.

From St. Petersbourg I crossed the Drance of Valsorey, so named to distinguish it from the Drance of Mont St. Bernard, the former taking its source at the foot of an extensive glacier of the same name, though nevertheless a branch of the great *Mer de Glace*, or *Frozen Sea*, called *Txermotana* or *Hautema* by the Vallaisans, of which I shall speak more particularly in its proper place. This torrent I therefore crossed, and continued ascending for nine long miles, previous to reaching the top of this tremendous

pass, and by a road so terrific, steep, and irregular, that no conveyance except mules can be used by travelers; and, what is worse, it never can be ameliorated, the snow being in many parts, at all times of the year, permanent. As I by degrees arrived nearer the top of this Colossean mountain, how wild and arid did every object appear! with the exception of a small forest of larch and fir, which I passed through at about two miles from St. Pierre, as if to bid adieu to this last remnant of vegetation; for, besides these, nothing but a few shrubs, birch, and stunted pines, thinly scattered on the dreary wild, presented themselves around; and they but too forcibly announced, by their languor and wretched appearance, that the region or temperature in which they grew was no longer fit for them. To these succeeded the *rhododendrum hirsutum*, and then a short close grass, conspicuous only in that part of the valley where the snow was melted, while moss and lichens were here and there seen in small quantities on the blocks of rock which surround the road. At last, as I approached the summit, I came to a spot apparently abandoned by Nature. The kind of chaos in which I was, the profound silence that reigned around, interrupted only by the melancholy rumbling of the Drance, which rolls its impetuous waters among tremendous precipices, served to convey sensations of gloom and terror not to be described,—yet at the same time infused such sentiments of wonder and surprise, at the magnitude of the objects, and the singularity of the dreary and terrific scene which spreads itself around for so great a distance, that I became riveted to a spot, which cannot be viewed without emotion or astonishment. Having however reached the top of the Prou (a kind of dale or pasturage, nine hundred and seventy-three toises, or six thousand two hundred and twenty-one English feet three-quarters above the level of the sea, very nearly filled with fragments of the lateral mountains, where the inhabitants of Orsières and Lides send their sheep to graze during the months of July and August), I perceived, on my left, the spiry summit of Mont Velan, where the snow is perpetual, and of which the height, according to Père Murrith (canon of St. Bernard, the hospice or convent of friars on the top of the mount, a person well known by his literary knowledge, as well as by his extreme tenderness and humanity towards the distressed traveler of the Alps), is one thousand seven hundred and thirty toises, or eleven thousand six hundred and two feet and a quarter above the level of the sea. That mountain, which is one of the highest that forms, and indeed overhangs, the summit of St. Bernard, serves as a support to the before-mentioned glacier, which communicates to that of Valsorey, and, to credit the

reports of some chamois-hunters accustomed to pursue that animal among the most stupendous peaks of the primitive chain, extends upwards of twenty miles north-north-east. N° XXI gives a representation of that glacier, or rather that part which lies between the one of La Valsorey and that of La Valteline, a spot which I have chosen, in order to subjoin an anecdote which happened to me there the first time of my crossing the Great St. Bernard, some years ago, and which may likewise tend to show the hospitable disposition, the urbanity, and simplicity, of the Vallaisans in general.

Being under the necessity of passing this mount in my way to Switzerland from Turin, I furnished myself with a guide and mule at the city of Aosta; but, from the extreme brutality of the former, I was forced to send him back, with his beast, as soon as I had reached the summit,—a circumstance which, from not knowing what I was to encounter, and the weather being fair, gave me not one moment's uneasiness; for I supposed I should be able, without much inconvenience, to walk to the village of St. Pierre, where it was probable I might meet with some kind of conveyance. But, alas! he had not left me long, ere I grievously repented of having discarded him, the descent being, beyond any thing I could conceive, steep, irregular, and almost trackless; when, at once, the surrounding objects became suddenly intercepted by dark clouds, which were accumulating most tremendously, while in an instant they expanded, and I became, as it were, enveloped in them—the wind, during this time, forcing itself in violent and frightful gusts over the mountain, chilled my mind with horror. The clouds were so thick, that for the moment they obscured the light, and prevented my finding my way, while they wetted me so thoroughly, that, had I been soused in a river, I could not have been in a more deplorable situation. Yet were these only the prelude or forerunners of a still more dreadful storm; for while the wind, at every gust, increased and became terrific, so as to carry away or overturn whatever might lie in its direction (a circumstance which often happens on the top of the Alps), the thunder rolled and lightning flashed beneath my feet, and, wonderful as it may appear, hail, intermixed with large flakes of snow, fell thick upon me, and seemed to blow from every part. Thus chilled and comfortless, I stood unavailingly lamenting my want of precaution, and was on the point of throwing myself on the earth, and resigning myself to fate, having never before or since encountered such a storm. Not a tree could I discover that might afford the least shelter; nothing but huge and barren rocks, heaped one on the other to an extreme height, displayed themselves around, and very nearly





filled up the gorge of the mountain. But at the very moment when I fancied myself alone, abandoned, and exposed to the fury of the elements, the sound of a human voice struck my ear, apparently at no great distance, although I was for some time unable to discern whence it came. While, with sharpened sight, I eagerly sought about, the request for me not to advance, but instantly to screen myself under the nearest rock till the storm should be abated, was again repeated. With this command, which for the moment appeared supernatural, I immediately complied, and soon after espied my guardian-angel in the habit of a pilgrim, wedged in between two rocks. As soon as I could with safety quit my situation, I made my way, as well as I could, over the stones which separated us, and joined him, with quickened pulse and renovated spirits. Having kindly made room for me, we entered into conversation—when he informed me of the particulars of his pilgrimage, and the cause of his happening at that time to cross the mountain. After speaking of the fatigue and hardships he had undergone, and the many astonishing things he had seen at Rome during the Passion-week, he smilingly asked me, whether I could suspect what had tempted him to travel so far on foot alone and unprotected? Answering in the negative, he continued by saying, “That, having a partiality for a relative, whom his parents, from principles of devotion, would not consent that he should marry, unless he previously obtained permission of the Pope, he had undertaken the journey; and having met with success, and being but a few hours’ walk from the parental roof, near which the object of his affections resided, he rejoiced that he had acquiesced.”

During this young man’s recital (who appeared intelligent, communicative, and amiable, and had scarce attained his three-and-twentieth year), I stood listening with silent attention, feeling every emotion of his heart as if vibrating in my own; yet time imperceptibly glided away, and I became uneasy, from being ignorant of my situation, and could not refrain from expressing my fears on that account;—at which, with extreme candour and civility, he begged me not to be distressed; that, if I would but accompany him, he could insure me a welcome reception and a bed; that, as his dwelling was rather nearer than St. Pierre, the village I was desirous of reaching, he advised me not to decline his offer, for that on the morrow he would conduct me thither, and procure a mule for the continuance of my journey.—Though nothing could be more humane or generous than this offer, yet did I hesitate, and knew not whether to accept or refuse,—a state of indecision which originated neither from suspicion nor fear, but

totally from a degree of torpor or indifference, which I have often experienced on the top of the Alps, beyond a certain elevation, and more particularly after a storm. He however, by a renewal of his solicitations, and the weather becoming tranquil, soon decided on my accompanying him; when we immediately quitted the beaten track, and taking a narrow path, which led in a northern direction from the summit of the Prou, turned with difficulty the basis of a lofty mountain, which serves as a support to an extensive glacier, on the sides of which we for some time proceeded. In short, after an hour and a half's walk, as painful as it was in many parts dangerous and terrific, we reached the top of a hill, situated at the extremity of a valley not so contracted as the former, the opposite end of which commands another glacier, that appeared to lose itself in the clouds, and was, as he informed me, a branch of the Tzeudy, prior to its junction with La Valsorey. The view from thence was, even at that hour of the day, beautiful, and the contrast between the smiling verdure of the vale, in which were dispersed a number of small chalets, and the immense glaciers and stupendous mountains crowned with perpetual snow, which raise their spiry heads in the back-ground, and seem to terminate the horizon at its northern extremity, was at once so singular and majestic a sight, that I could not, though nearly worn out with fatigue, refrain from taking a hasty sketch of a prospect which will ever remain in my memory, and which I have since rectified as it now appears in N° XXI. No sooner had we gained the summit of the above-mentioned hill, which likewise commanded the valley that contained my companion's happiness, than we soon observed cattle grazing, and persons going in and out of one of the chalets that I had previously noticed, and which was built against a rock that considerably projects into the valley. The people, from every appearance, displayed visible symptoms of anxiety and agitation, walking to and fro with hasty steps, as if some accident had been occasioned by the late dreadful storm; but the moment we were espied, they as instantaneously directed their course to the bottom of the hill; on which, seeing my pilgrim change colour, and no longer able to contain his feelings, I concluded that we were at last arrived at the happy spot, and asked whether he knew those that were coming towards us:—"Yes," he hastily replied, with the tear glistening in his eye, "those are indeed my parents, and that our dwelling, where, for four months in the year, we bring our cattle to graze:" then, running a few steps, as though he could have flown into their arms, he suddenly paused, and seeming to recollect himself, added—"I go too fast for you; my impatience makes me forget myself;

but you must excuse me." Then pointing to a venerable old man, with a beard as white as snow, "That," said he, "is my father; the woman next to him is my mother; the youth who supports the first, my brother; and my sister follows:—but where is my Juliana? where is my beloved? What will become of poor Maurice (which was my pilgrim's name), should she be no more? Alas! why have I gone to Rome, should she be faithless?"—Still we journeyed on; and, as we walked with hasty steps, I tried to tranquillise the agitated youth, who, on the approach of his father, forgot, for the moment, every other sensation.—Good heavens, what a scene did I witness! what amity, cordiality, and affection!—sensations which are, in general, better felt than described; though never so pure and untainted as by those, who, like these honest people, have never been vitiated or perverted by the vices of towns and cities. Their joy flowed spontaneously from the heart, and so unmixed with insincerity, that, seeing me the companion of their child, that introduction was sufficient, and every token of affection was equally lavished on me: in fine, after a thousand interrogatories, salutations, &c. had taken place, we reached the humble habitation, a small and simple wooden cottage, in which was visible a neatness and cleanliness, that, in my mind, is preferable to gaudiness and splendor. Here we found an excellent rural repast, such as an anchorite would have boasted of: but still my poor Maurice remained in cruel suspense. Perceiving their silence, and dreading to be informed, his conflict was such, that I, who narrowly watched his every action, as well as turn of countenance, dreaded the consequences. At last the good old man broke silence, by asking the result of his journey, and whether he had succeeded? Hereupon, without uttering a syllable, he hastily got up, and snatching a small bundle which he had brought, took from it some small pieces of reliques, and laid them on the table,—which the family no sooner saw, than they instantly knelt round it: he then placed a paper next his father, containing an indulgence for himself, family, and friends, having previously taken out the permission or licence, which he put into his mother's hand, saying, "That he now deemed this unnecessary, since his Juliana, the object of his love, who had been the cause of his pilgrimage, and who must have known of his return, was no longer for him;"—then with a sigh, and a heart swelling with anguish, he screamed out, "She must be dead, else thus she never could have acted!"—These words were scarcely uttered, when a door next the chimney opened, and out rushed a female, who ran, clung to his neck, and fainted. The joke had nearly been carried too far; but with care she,

however, fortunately recovered, and joy as instantaneously succeeded. As for myself, who had with scrutinising eyes watched the whole process, and longed to find Juliana deserving the affection of a man who had encountered such hardships to obtain her, I was delighted to perceive, that, with a most interesting figure, which might be styled pleasing rather than handsome, an animated countenance, tall, well made, and just nineteen, she appeared to possess sentiments so congenial to his own, as could not fail to make him the happiest of mankind.

Her dress was singularly pretty, simple, and quite in the Vallaisan style, so exactly corresponding with the description given by Rousseau of her countrywomen, that I was quite charmed with her. Two days did they insist on my lengthening my stay; and on the third I departed from this mansion of peace, the whole party accompanying me as far as St. Pierre, where the nuptials were performed, and where, with heart-felt gratitude, I expressed my acknowledgements for their hospitality and attention;—then left them to return to their habitation, and quietly proceeded on my journey. But, before continuing it, I shall return to the description of the summit of the pass, this being a digression I was not willing to omit.

At the eastern part of the valley of St. Prou, before mentioned, stands the extensive glacier of Menone, which stretches nearly as far as the high road, and which, like the rest of the glaciers in the Alps, pushes before it heaps of stones and sand, forming a mound that extends over the pastures. Those masses of rock, which are fragments of the stupendous peaks that crown the glaciers, are mostly composed of a kind of micaceous quartzose stone, with strata of different thicknesses, similar to the mountains that lie contiguous to the road; for no granite whatever did I perceive from the village of Lides; and even there that species of stone is only found in blocks, as before mentioned. Some few of the peaks of the glaciers are nevertheless formed of a kind of lamellated argil, streaked with quartz, containing various sorts of roundish, or kidney-like stones. These stones are of different colours, and vary singularly with regard to the direction of their strata; though the major part may be deemed nearly vertical, intermixed with veins of copperas pyrites. From the summit of the Prou, the road continues through another narrow valley, called La Combe, much more contracted than the former, and where, in many places, the snow is permanent. Contiguous to the high road, two small buildings have been erected, which are vaulted, and called the hospital. One of them serves as a refuge for travelers of every description, there being

at all times fire, bread, wine, and cheese, regularly brought by a brother monk, who, during tempestuous weather, regularly visits this building, which is distant three miles from the hospice or convent, built on the summit of the mountain, where the traveler of the Alps is at all times received, and where the monks, by affording a comfortable shelter from the inclemency of their frozen regions, have preserved the lives of many.

These monks, who are in general called *Maronnier*, or *Hospitalier*, in fact a kind of Augustine friars, are mostly strong and robust, perfectly well acquainted with every part of the mountain, for which reason they are chosen to protect travelers during the great falls of snow and the *avalanches*, when they are oftentimes under the necessity of digging them out, at the depth of even twenty feet. For this purpose a large dog, not unlike the Newfoundland, is kept at the convent, who regularly accompanies these charitable beings, and by means of his scent discovers the poor wretches who are apparently lost; then the friars (even the superiors, for in time of danger none are exempt) dig till they succeed in extricating the unfortunate person, who, if not too late, has every assistance administered, and is conveyed to the convent, where the greatest care is taken of him till perfectly recovered. Should it be necessary to amputate, the operation is performed with the greatest humanity, and the utmost tenderness is shown while in the hospice; but if, on the contrary, the patients be past recovery, they are removed to the second building, noticed above, called the traveler's *cimetière*, or burying-place, where each individual is placed in his clothes, that he may be the easier known; and so intense is the cold in this frozen region the whole year round, and of course so very unfavourable to putrefaction, that, the last time I crossed the Great St. Bernard, there were bodies which had been remaining two years, without the least appearance of being disfigured. At half a league from this melancholy abode, the road crosses the Drance, which takes its source at no great distance from the bridge there thrown across; for the summit of the pass is the point of separation between the waters which fall into the Adriatic sea, and those which throw themselves into the Mediterranean.

Previous to reaching the convent, the ascent is so extremely steep, that one may almost call it abrupt, and nearly covered with immense pieces of rock; but what must appear singular, though a circumstance on record in the convent, is, that a woman, sixty years of age, returning from some of the neighbouring hamlets, having been overtaken by a storm, sought refuge under one of those rocks, which in an instant, by a

sudden gust of wind, was totally covered with snow, and the good woman buried twelve feet deep. In this situation she lay six-and-thirty hours, till discovered by the before-mentioned dog, when she was taken to the convent, and absolutely recovered.

Near this institution is a wall of amazing thickness, which shelters some small buildings thereunto belonging from the *avalanches*, or falls of snow, from the neighbouring mountains. To this succeeds an *esplanade*, or plain, that commands a small lake, as represented in the drawing (N^o XXII), of considerable depth, on the edge of which stands the convent, the dreary and arid appearance of which, as well as every surrounding object, added to the disorder and general confusion which exists, give a most forcible idea of chaos, or Nature in a state of absolute sterility,—for all is barrenness and stagnation, nothing like vegetation: it is, however, a spot consecrated to humanity, religion, and hospitality, where their votaries have sought an asylum, and practise the Christian virtues with the greatest energy, enthusiasm, and disinterestedness.



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DESCRIPTION OF THE HOSPICE ON THE GREAT ST. BERNARD.

SOUTHERN DESCENT OF THAT MOUNTAIN.

ENTRANCE INTO THE PLAINS OF PIEDMONT.

THE Hospice, or convent, erected on the summit of this terrific pass, as mentioned in the preceding section, is, doubtless, the most elevated habitation known to exist on our globe, since, according to monsieur de Saussure's measurement, it is found to be twelve hundred and fifty-one toises, or about eight thousand English feet, above the level of the sea. Yet it does not stand on the highest part of the mountain; for the contracted valley in which it is built is still commanded by high and tremendous peaks, which serve, as it were, for a shelter, and are many of them fifteen hundred feet above the small lake, on the edge of which stands the convent.

These acute points, called *aiguilles*, or needles, which appear like frozen pyramids, from being always covered with eternal ice and snow, are not granitic, though deemed to form one of the highest primitive chain of the Alps; but, on the contrary, seem to be a species of lamellated rock, of which the integral parts are in general argil, quartz, mica, and horn-stone; and whose strata incline so much towards the perpendicular, that in many places they have even a vertical direction. And though the molecules of those same strata have a great degree of coherency, yet are the bases of these spiry tops totally covered with their fragments, which are of different sizes, and in general assume a parallelopiped, or tetrahedron figure; which difference of form most probably depends on the more or less quantity of horn-stone, horn-blende, feldspath, and siliceous earth, contained in them. I have however remarked, at no considerable distance from the convent, nearly contiguous to the mountain of La Drossa, another species of rock, of thicker strata and closer texture, neither so rough nor shaggy, but glossy, and the surface of which, in many parts, was not only polished, but spotted with small grains of black grey quartz, which give it the appearance of granite, and render this kind of

stone particularly curious. To these I could with ease subjoin the description of many others of similar species, every one of which presents a variety of modifications, both in form and structure; and which at the same time tend to show, that though these points, or needles, be not of granite, it does not follow that they do not owe their origin to the effect of crystallisation, though their crystallisation may indeed be considered as having been more interrupted or retarded than the one by which the primitive or first mountains were formed; for all the species of molecules, which constitute the granite, are most assuredly found inclosed in the rock which composes those spiry tops.

(For the names of the peaks, see the Index to the Plates.)

At the basis of one of those pyramidical needles, situate on the north-eastern side of the convent, there exist some veins of a kind of crystallised lamellated iron, of a darkish hue, similar to the *minera ferri specularis lamellosa* of Wallerius, spec. 257, intermixed with copperas pyrites. These veins are, as it were, wedged in between thin strata of argil, of which the direction is nearly vertical, containing particles of quartz and mica.

Father Murrith, the canon of St. Bernard, before alluded to, has likewise discovered others, of different species, near the peak of the Drome, rendered extremely curious from their situation, and which I was truly sorry for not having time to visit; but which, from the samples that have been shown to me, seem to contain some valuable veins of *plumbagine*, or *molybdate* of lead, which might merit the trouble and expense of being worked for pencils, and would, I should suppose, be capable of being rendered very little, if at all, inferior to the lead-mines at Keswick, in Cumberland; though the greatest impediment that would arise, and which indeed cannot be removed, is, that nine months in the year they are entirely covered with snow.

The convent, more commonly called hospice, from indiscriminately giving refuge and shelter to every individual who travels that way, when overtaken by want, fatigue, or stress of weather, is of free-stone, containing a number of apartments and beds, to which is annexed a handsome chapel, where the service is regularly performed by the friars. This building appears, from Simlar, the historian, to have been founded in the tenth century, by one St. Bernard de Manthon, at that time a regular canon, and arch-deacon of Aosta. Animated by sentiments of humanity, that worthy character, who was a descendent of one of the most ancient families of Savoy, caused this convent to be erected, at his own expense, on the summit of the mountain, till then called Joux, or Jovis, for the assistance and reception of travelers, who might be forced to cross

that frozen region of the Alps; and at the same time annexed to it funds sufficient for the completion of the establishment. He at first began by fixing only a certain number of Augustine friars; but soon after retired there himself, in order to superintend, watch, and encourage by his example, the execution of the rules he had planned for the relief of the poor, as well as to afford a comfortable asylum to those who might need assistance. For this pious act, the pontif Alexander II. conferred on him the dignity of prévôt, with the privilege of being crosiered and mitred as a bishop. This acknowledgement of the virtue of the founder, and of the merit of the undertaking, soon inspired several of the European princes and grandees, who, sensible of the great use of the institution, vied with each other in donations, in order to maintain it according to the original plan; so that, in fact, it so insensibly and rapidly increased in wealth, that in 1460 it had not less than fourscore livings in its possession, besides landed property in Piedmont, Savoy, Switzerland, Sicily, Germany, and even England.

Unfortunately, however, we see in this institution, far removed, as might be supposed, from the vices of the world, that neither soil nor region is proof against the corrupting influence of riches, that bane of virtue, and consequently of happiness,—properly termed by the poet *irritamenta malorum*; for, from the arid summits of the frozen Alps to the fruitful smiling plains of Europe, all are alike! and how many are to be found whom even profusion cannot satisfy! Such was the case here; for, in consequence of the abundance of wealth and high degree of power which this institution had acquired, ambition, with its disquieting train, jealousy and contentions for pre-eminence, soon began to distract the community, and had nearly proved fatal to the establishment itself. To this may be added, as an accumulation of misfortunes, and by which their existence seemed threatened, that the pope, having once granted to the prévôt the title or dignity of commandatory, he, forsooth, thought himself authorised to desert the convent, and take up his residence in a large city,—where, from dissipation, negligence, and donations to his family, which were of course imitated by his followers, the immense property belonging to the institution was soon found to be almost expended. Nor was it till the year 1589 that the friars were roused from their stupor, who, in consequence of long and warm debates, compelled the prévôts in future, on pain of forfeiting their appointment, to reside continually at the convent.

This measure, though excellent in itself, and at that time extremely necessary, could not however retrieve the landed property, and vast sums of money, heretofore alienated

by the *prevôts*; and the community soon found it impracticable to follow the original rules, as dictated by St. Bernard, for want of sufficient funds. In addition to this calamity, fresh distress arose, by the duke of Savoy's losing the Pays-de-Vaud, the Pays-de-Gex, and the Vallais, in which they had still considerable possessions. This unforeseen misfortune soon forced them to determine on sending some of their community, yearly, to Italy, France, Switzerland, and Germany, in quest of donations,—a circumstance they have had no reason to repent of; for they were, and are still, so successful (this custom being continued), that, from their own acknowledgement, they are at present enabled to follow, without the least deviation, the original intention of succouring, indiscriminately, every traveler that crosses this tremendous pass, without regard to religion, rank, or sex. These acts of beneficence become the more meritorious, and show the excellent regulations and great œconomy of their present system, that though every article of provision, &c. must be unavoidably brought from the foot of the mountain on mules, owing to the arid and desolate state of their situation, not having even a blade of grass, or the least appearance of vegetation, for the space of five or six miles round, both north and south, so that Nature seems totally dead, yet are these venerable men indefatigable in their pursuits, and have their bread, wine, butter, milk, hay, straw, and even wood for firing, thus conveyed, although it occasions infinite labour and great expense. They have likewise one hundred and twenty cows belonging to the convent, which, during the summer months, graze in one of their meadows, about six miles distant; and though their produce in butter must of course be considerable, yet is it not found adequate to the consumption of the house. But the object which they mostly complain of, and which becomes heavily expensive, is the wood: thirty mules are regularly employed, four months in the year, in fetching it from the basis of the mountain; and, considering the small quantities each time conveyed by those animals, and the number of fires invariably kept up the whole year round, this article is a heavy charge to the community, and accounts for their not baking in the convent. They have their bread made five miles off, in the hamlet of Auxières. The provisions likely to be met with in the house, and indeed the only ones that can be preserved good for any time, consist in salt meats, dried fruits, and vegetables, with different sorts of Italian paste, such as macaroni, vermicelli, &c. all excellent of their kind; but as for fresh meats, they never can remain long in that state, owing to the extreme rarity of the air.

Before concluding this description, I shall give my reader some idea of the different functions or dignities exercised by the friars, who may assuredly, by their religion and virtues, be deemed ornaments to humanity. The first of these, as before noticed, is styled the *Prevôt*, chosen by a majority of votes from among the community: he must, however, have employed his youth in every act of hospitality towards the relief of the unfortunate traveler of the Alps; and of course, at the time of being chosen, is in general old and infirm; for which reason, since the late regulations have been established, he is allowed to reside at Martignie, which, the reader may recollect, is seated at the basis of the mountain, where the chapter has still a house and some church-lands belonging to it. This house, or rather *château*, likewise serves for an asylum to the rest of the friars, whom age and infirmity prevent from living on the top of the mountain. The second in rank may be deemed the *Prieur Clausral*, who is expected to be a resident in the convent, and is charged with the administration of the community. Thirdly, the *Sacristain*, who superintends the care of the chapel, which is well decorated, though on so barren a spot; for the altar, in particular, exhibits marble columns of exquisite workmanship, which must have cost immense labour and expense, merely for their conveyance hither. Fourthly, the *Celier*, or *Procurateur*, who has the care of providing, giving out the provisions, and also of transacting the external business of the house. Fifthly, the *Father Clavandier*, who distributes the necessary wine and liquors to travelers, as well as to the community at large. And, sixthly, the *Father Infirmier*, to whom the care of the sick is confided, and who must consequently understand surgery and medicine.

The number of friars who now form the community is five-and-twenty, twelve of whom are to be constantly resident in the convent, and the rest either at the different curacies belonging to the chapter, which are generally filled by the eldest, or else on their travels in quest of donations. The above charges or functions do not, however, in the least prevent them from rendering every assistance in time of danger, or during the grand passages, which are those times in the year when business renders the mountain more frequented; for, with the greatest philanthropy, do they all, indiscriminately, lend a helping hand to the unfortunate, and pay a generous tribute to suffering humanity, by administering every comfort to the unhappy being who appears overcome with fatigue, cold, or lassitude; and every individual, let his situation be what it may, meets with kind and generous treatment; and all are, with equal attention, lodged, fed, and attended to,

gratis, as long as necessity obliges them to stay. A large comfortable apartment is allotted for the poor; while those who make a more decent appearance remain with the community, and eat at their table during their residence. Surely, then, too much praise cannot be given to the founder of such an institution, as well as to the zeal, indefatigable care, and extreme humanity, of those respectable men, from whom I have not only experienced the kindest attention, but have witnessed the dangers they run in rescuing from the snow the unfortunate traveler. I cannot but express a hope, that, whatever changes the religious and political systems of Europe may undergo, this institution, as to its great object, will not be abolished. Yet, with all these precautions, scarcely a year passes without some, and indeed I may add many, individuals perishing while crossing this passage, which may certainly be regarded as one of the highest of the Alps; and many, though they may not be totally given up to death's cold embrace, are frequently found with their limbs so frozen, as to acquire amputation,—a circumstance which, to those who are unacquainted with the country, and the number of persons who annually pass, must naturally appear dreadful, and create melancholy reflexions; but when it is considered that, one year with the other, no less than five-and-twenty thousand travelers, mostly Italian and German, actually cross this mountain, the astonishment ceases, and it in fact becomes wonderful that the lives of so many are preserved, as appears by the account of the friars.

Having staid two days in the convent, and examined most of the adjacent spiry peaks, I quitted this hospitable mansion early in the morning of the third, in order to proceed to the city of Aösta; and though it was the commencement of July, the cold was extreme on the top of the mountain, Farenheit's thermometer being mostly at thirty-five degrees; but at half past nine, on the eve of my departure, it was as low as twenty-eight, consequently below the freezing point.

The road descends immediately from the convent, having on one side the lake (on the edge of which that building stands), whose water, from its extreme depth, appears of a deep blue colour, with a blackish tint; and on the other, the basis of the peak Drossa, which is, as it were, crossed by the small canal, constructed at the friars' expense, on the eastern part of the mountain, as previously mentioned, in order to convey water to the convent. I then soon left the Vallaisan states, and entered the territories of his Sardinian majesty, of which a small column indicates the boundary, as represented in N° XXII. which likewise gives an idea of the convent, with the lake

and surrounding spiry needles. From hence the road passes along the bottom of another valley, which may be considered as a continuation of the former. This valley is called Jupiter's Plain, from there having originally been a temple on the spot dedicated to that divinity; and indeed some historians go further, and suppose it to have been the place where, even in the time of the Romans, there existed an *hospitium*, or kind of hospital, on nearly the same principle as the present, and that St. Bernard was only the restorer of that humane establishment. Be this as it may, the deed remains equally meritorious, whether he be considered as the founder or the restorer. It is also an incontrovertible truth, that this passage was, before the erection of the convent, styled *Joux*, or *Jovis*, and that on its summit stood a temple dedicated to Jupiter Penninus,—a circumstance which doubtless gave the appellation of *Pennine* to that part of the Alps, *pen*, or *penninus*, being of Celtic etymology, and meaning lofty or high.

These conjectures seem to be strongly confirmed by a number of medals and inscriptions found in the environs of the temple, of which several vestiges are still extant, besides some *ex-votos* in copper, iron, and even wood, which clearly show that this mountain was frequented by the Romans, who deemed the passage so dangerous, that, before undertaking it, they sometimes devoted themselves to this divinity; for on one of the *ex-votos* are the following words:

JOVI PÆNINO
Q. SILVIUS PERENNIS
TABELL. COLON.
SEQUANON.
V. S. L. M.

It likewise appears that this same Jupiter had the reputation of being deemed an oracle by the people of the surrounding countries: while others, again, have been of opinion (among whom is Pliny the historian), that this temple might probably be the work of the Carthaginians, at the time that Hannibal passed the Alps, and that Jupiter Penninus may have been one of their divinities. This opinion, however, of Hannibal having crossed the Pennine Alps, little agrees with the account given by Polybius and Livy in their histories of Hannibal's march; and has been refuted by so many learned and scientific modern writers, who have well examined the geography of the country, as well as the historical details of the wonderful invasion of Italy by the Carthaginian general, that the supposition of his having passed in this place must be abandoned as erroneous. Besides, by the many facts and data collected on that subject, it seems that

the temple of Jupiter Penninus was destroyed by order of Constantine, who caused a *colonne milliaire*, or Roman mile-stone, to be erected on the same spot, with the following inscription:

IMP. CÆSARI CONSTANTINO
P. F. INVICTO AUG. DIVI CONSTANTINI
AUG. FILIO BONO REIPUBLICÆ NATO
F. C. VAL. XXIII.

This column has since been removed to the village of St. Pierre, where it now remains a standing monument of having, from every appearance, been the one above-described, as the number *twenty-four* exactly corresponds with Antoninus's account, who, in his Itinerary, places the twenty-fourth mile-stone at the top of the Great St. Bernard.

From this valley, which widens considerably, and is both rude and wild, the road rapidly descends by the sides of stupendous rocks, of similar species to the spiry rocks near the convent, and along the edge of the frightful and noisy torrent of the Butier, which takes its source on the summit of the pass. Having thus continued, for the space of four or five miles, I reached the *châlets* before alluded to, called *vacherie*, from their being the dairies where the butter and cheese is made for the convent, as also the spot where their cows are sent to graze, which is but for two or three months at most, owing to the severity of the climate; for, even at the time I passed across, though in the month of July, nearly the whole was covered with snow. Yet I had not proceeded far, ere I began to perceive a few stunted trees, here and there thinly scattered, though the mountain still remained extremely steep.

Here it may not be improper to observe, that, notwithstanding the Great St. Bernard, Mont-Cenis, Little St. Bernard, and the Col-de-Tende, are infinitely more abrupt on the side of Italy than towards Switzerland and France, yet is the vegetation more forward, and at a much greater elevation, than on the other. As I drew near St. Remy, the first village in his Sardinian majesty's states on that side of the mountain, at the extreme height of five thousand and ten feet above the level of the sea, the country began to wear a very different aspect, and displayed more cheerful tints of colouring; for, while an extensive forest of larch and pine stretched out its thick foliage, as if to shelter the village from the north-easterly winds, I could easily discern a number of pastures, covered with *châlets* and cattle, on the opposite side of the torrent. On entering this village, and having changed the states, I was of course under the necessity of com-

plying with the usual interrogatories, to which I answered, showed my passport, and proceeded to the inn, where I remained till the next morning, perfectly satisfied with my accommodations, having really met with every convenience that constitutes a good inn. From hence the road still descends, about four miles further, along a contracted mæandering valley, and then, in many parts, becomes both rapid and abrupt, hanging tremendously over the torrent which flows beneath; but at the wretched miserable hamlet of St. Oym, inhabited by muleteers only, it is less terrific; and as far as Etrouble, a village two miles distant, I had an interrupted succession of beautiful views. At the last-mentioned village, which is seated in a hollow, I crossed the torrent Butier, and ascended a rapid mountain of schistus, tolerably well wooded, the different windings of which I followed for the space of three or four miles, and then reached the sides of another, apparently composed of a species of coarse-grained sand-stone, or rather a kind of pudding-stone, containing in its interior many fragments of primitive rock; but as its cement is calcareous, the inhabitants convert it into lime,—a circumstance which accounts for the prodigious number of kilns, which may there be said literally to line the road.

The valley of Butier soon after contracts so considerably, that the road becomes again tremendous, and hangs, as it were, suspended by means of a wide cornice, which shelves over the torrent, that rolls its foaming waters with great impetuosity, and of an extreme depth. The entrance of this defile is shut up by a *mur crenelé*, or kind of battlement, with a door guarded by a few invalids, and, like the generality of defiles, is called *Cluse*, or *Ecluse*. Its rocks seem to be a species of lamellated micaceous quartz, of about one foot in thickness; and at Gignaud, six miles hence, a considerable village, seated nearly at the basis of the valley, through which the high road passes, the neighbouring mountains appear likewise to be quartzose and lamellated, though in their vicinity I met with a hill totally formed of a kind of schistus, striated with calcareous spath and inclined strata. Here the country again renovates, and becomes pleasant and well cultivated; for large and lofty chesnut-trees shade the road on both sides, while the hills, whose basis I was pursuing, were covered with luxuriant vines, exhibiting so different a scene from what I had lately been accustomed to, that it imperceptibly obliterated the recollection of those tremendous passes I had but a few hours before ventured to encounter, and which now appeared but as a dream. Being arrived at Signaye, the last village before reaching the city of Aösta, from whence the

distance may be about three miles, the road is in several parts shaded by peach, mulberry, and *micoulier*, or Celtic-Australic trees, which, added to the noise of the *cigale*, a kind of grass-hopper peculiar to hot countries, announced my approach to the plains of Italy. As I imperceptibly drew near the environs of Aösta, the valley gradually widened, and this ancient city, which is seated in a kind of plain or basin, where several valleys terminate, brought strongly to my remembrance Chamberry, the capital of Savoy; yet not altogether from its situation, though, like the latter, on all sides surrounded by lofty mountains, and built on the edge of a fruitful plain, watered by rivulets which descend from the summit of the Alps, but more from the manner of roofing the houses, which are mostly all covered with slate, and the incredible number of spires and towers which rear their heads above the rest of the buildings.

The three principal valleys which terminate at Aösta are circumstanced as follows: First, the one I have just described, which comes from the summit of the Great St. Bernard, watered by the Butier in its whole length, which throws itself, near the city, into the Doria Baltea, a river taking its source at the southern side of the basis of Mont-Blanc. Secondly, the one which leads to the Little St. Bernard, a mountain which has no connexion with the former, though of similar appellation, and one of the principal passes from Italy to Savoy, thirty miles from Aösta. This valley is nearly watered throughout by the above-mentioned river. And, thirdly, the one which conducts to the city of Ivrea and the plains of Italy, which I shall hereafter describe, still watered by the Doria Baltea, which runs into the Po, contiguous to Crescentino.

The city of Aösta, originally known by the name of *Augusta Prætorium*, or *Prætoria*, is the capital of a duchy of the same name, which, though not extremely fertile, being wedged in by the Alps, yet breeds vast quantities of cattle for the Piedmontese, to whom the inhabitants also furnish butter, cheese, and wines, from their own fields and vineyards, which are much esteemed. The people of the country speak both French and Italian; but, as the duchy is situated at the eastern part of the Alps, and the Italian is not only considered by them as the more general, but the more natural language of the two, it is now considered as making a part of Piedmont, having belonged to the House of Savoy for several centuries. Those who inhabit the high lands are, like the Vallaisans, or indeed all mountaineers, strong, robust, healthy, and of pleasing physiognomy; but the others, on the contrary, like the inhabitants of the Lower Vallais, are weak and unhealthy, and many of them subject to goitrous appearances. Aösta is also

a bishop's see, and, before the revolution, was suffragan to that of *Monetier*, in the *Tarantaise*, a province of Savoy. There is likewise a chapter and public college, where the belles-lettres and other sciences are taught gratis, as at Lausanne, Vevay, &c. besides a multiplicity of churches and convents, as before noticed. The *maison-de-ville* is extremely ancient, but still worth seeing. The streets are wide, handsome, and regularly watered, during the summer-months, by a spring from the *Doria*, which renders the city not only pleasant and agreeable, but particularly healthy for the inhabitants, during the intense heat, which, for a few months, is excessive, owing partly to its situation, which is in a hollow, and partly to its latitude, which is only $45^{\circ} 49'$, the longitude being $7^{\circ} 4'$; as also, in some measure, to its small degree of elevation above the level of the sea, which does not exceed eighteen hundred and sixty-six feet.

As this city was built by the Romans, after the entire subjugation of the *Salassi* by Terentius Varro, about the year 718 of Rome, and soon after a colony of three thousand soldiers were sent hither, many Roman monuments still exist, some of which are wonderfully well preserved. Among these may be counted a triumphal arch, an amphitheatre, and two bridges, besides several other objects similar to these. There have also been dug up, in its vicinity, a number of Roman medals, gold, silver, and copper coins, vases, lamps, sepulchral urns, &c. many of which have been conveyed to the Museum at Turin. Though the distance from Aösta to the last-mentioned city does not, in reality, exceed sixty-three miles, which, to an English reader, must appear a very inconsiderable distance, yet is that distance not traveled in one day but with the utmost difficulty, in great measure owing to the road being as yet scarcely practicable for carriages, and at the same time crossing such a mountainous and mæandering country, till it reaches Ivrea, thirty-eight miles from Aösta, that traveling by post can, and must, only be deemed to take place from hence. On the high road which leads to Piedmont, at no great distance from Aösta, stands a beautiful triumphal arch, erected in honour of Augustus. This noble monument, which is composed of large blocks of stone without cement, very like a species of pudding-stone, or coarse-grained sand-stone, seems to have been originally faced with marble, and ornamented with inscriptions and bass-reliefs, of which it has since been divested. The valley, which is here tolerably wide and well cultivated, tends in an eastern direction; and the mountains which screen it on both sides, to judge by the loose fragments which lie contiguous to the road, and the continuation or branchings of their roots, which meet in the centre or middle of the valley,

appear to be formed of a species of quartzose rock, similar to what I had before seen near the summit of the Great St. Bernard: but as to their form or shape, they seem to resemble those of the secondary chain of the Maritime Alps, as I remarked that their slope or declivity, but not their abrupt sides, are here again turned towards the interior of those same valleys, and that in many parts their injecting angles correspond to the salient or projecting ones,—appearances which have led me to suppose, that their origin, or rather their present form, may be attributed to the operation of the sea, at its last retreat, as observed in a former work *, and not to the sudden sinking or falling of any vaulted cavern, as the major part of those which are situated at the west or north-western chain of the Alps, where the abrupt sides of the mountains are in general turned towards the internal part of the valleys.

Another remarkable circumstance, which shows the amazing similarity that exists between the Pennine, Lepontine, and Maritime Alps, is, that, invariably, from the city of Aosta to that of Ivrea, as from Limon, at the basis of the Col-de-Tende, to Coni (the fortress lately ceded to the French by his Sardinian Majesty, till a general peace takes place), there reigns throughout those first mountains a striking and astonishing confusion and variety, both as to form and direction of strata, as well as in their structure, which is mostly composed of argil, horn-stone, quartz, mica, and feldspath; likewise, that the calcareous mountains which constitute the southern or eastern part of the Alps are much fewer in number than those which form the long chain of tertiary mountains at the north western. It is again necessary to observe, that, on the side of Italy, the declivity or slope of the mountains, in general, is not only more abrupt than on the sides towards France and Switzerland, but that the schisti and species of refractory stones extend to the very plains of Lombardy, apparently free from that quantity of calcareous matter which is so conspicuous on this side of the Alps, and which, in fact, serve as a kind of medium between the secondary mountains and the sand and pebble hills that are in general found at the entrance of most large or extensive valleys.

At no considerable distance from Aosta, the road passes through Nuz, a village seated on the banks of the Doria, and on the edge of a rapid torrent which falls from Monte Servino. This village, which was formerly much more considerable than it is at present, and commanded by an antique château, of which some vestiges may be seen,

* The Author's Maritime Alps.

is extremely romantic, being surrounded by mountains; for here the valley of Aosta begins considerably to contract. From Nuz I proceeded across Chatillon, a small old town, the streets of which are all on an extreme declivity, and the houses roofed with wide dallas, or laminæ of a rock found near Madalena, a village seated at the basis of Monte Servino. This stone seems to contain feldspath, mica, and quartz; and in several places I have observed a species of copperas veins, in small grains, not unlike writing-sand. Before entering this town, I crossed a considerable torrent, on a beautiful stone bridge, which rests on two rocks, that bear every appearance of having been cut through by the effect of the friction or attrition of the torrent itself. Not far from hence, and on the same torrent, are the ruins of an arch, imagined by the people of the country to be of Roman construction, a conjecture which the style of the building seems to confirm.

Contiguous to Chatillon, I observed on my left a lofty abrupt mountain, formed, as far as I could judge, of a species of micaceous calcareous stone, which effervesced with acids. Three miles further, the road passes through St. Vincent, a village much frequented on account of its mineral springs, which have acquired great fame in Piedmont. Its waters are ferruginous, containing a quantity of fixed air, Glauber and marine salts, with calcareous and argillaceous particles.

About two miles hence, I again found myself in a defile, from whence I crossed, or rather descended, Monte Jove, on which, it is also supposed, stood another temple dedicated to Jupiter. The road, which is here hewn out of the main rock, in an extent of above a mile, at a considerable height above the Doria, becomes particularly curious and interesting, from the confused mixture of the rock, though the most conspicuous may be considered as calcareous, quartzose, and micaceous: steatites I also remarked in mass, as well horn-stone as schorl.

The direction of its strata is likewise in some parts vertical, and in others inclined, without any specific arrangement or regularity, except the horn-stone, and a kind of reddish schistus, which here and there appeared to have their strata nearly vertical to the horizon. This visible confusion of primitive, secondary, and tertiary rocks, continues from Aosta, for the space of sixteen miles, to the ancient village of Verrex, which was not only known to the Romans, but used by them as the place where the gold and copper found in the adjacent mines were worked.

There still exists, near this village, in the valley of Grana, a mountain deserving attention, from having been, as it were, *criblé*, or nearly bored through, in every direction,

by the Roman miners. This spot, being exactly where a torrent of the same name throws itself into the Doria, the site is extremely picturesque; and the valley, being less contracted, the environs are fertile and pleasant: but it again soon after contracts, and, five or six miles further, forms a direct defile, commanded by the fortress of Bord, or Borde, seated on the summit of an abrupt rock, which may be considered as the first key of the valley of Aösta on the Piedmontese side.

The road is here strikingly curious, and the rock, in which it is hewn, abrupt, and fifty feet at least above its surface. In the interior of the rock, which is still quartzose, with vertical strata, stands, in a natural niche, a Roman column, bearing the number "XXX." Near the column is a door, likewise cut through the rock, by which I quitted this defile, and soon entered another, if possible more contracted than the one I had just quitted, which leads to the village of St. Martin, seated between two lofty mountains and the last village belonging to the duchy of Aösta,—for, immediately on leaving it, the road passes through a noble gate of free-stone, on which the arms of Savoy and Piedmont are richly carved. Two miles further I began to discern the beautiful plains of Piedmont; and at Borgo Franco, five miles from St. Martin, one of the first places in that principality, I found myself surrounded by fruitful well-cultivated hills, wooded to their summit, of which the most common trees, as in the environs of Coni, are in general walnut, chesnut, and mulberry,—the latter being much cultivated, on account of its being the indispensable food of the silk-worms, the produce of which little animals is the staple commodity of Piedmont. The inhabitants also cultivate a great quantity of maize, or Indian wheat, for their own consumption.

From Borgo to Ivrea, or Eporedia, the distance does not exceed three English miles, through a most beautiful well-cultivated country. This last-mentioned city is built at the foot of a small hill, apparently composed of a species of greenish serpentine: it is eleven hundred and ten feet above the level of the sea; and, from being considered the first key of Piedmont, is well fortified, and commanded by three châteaux or forts. This city is likewise the capital of a marquisate of the same name, belonging to the crown, as also a bishop's see, suffragan to the archbishop of Turin. The only object in it that merits attention, and may in some degree compensate for the tedious journey from Aösta to Ivrea, is the château of the late Count Perron, many years his Sardinian majesty's secretary for foreign affairs. This noble and extensive mansion contains a most valuable cabinet of mineralogy, a large and complete collection of the most

curious plants found in the Lepontine and Pennine Alps, including those of Piedmont, besides bas-reliefs, antiques, medals, ancient armoury, &c. From hence to Turin may be computed at five-and-twenty miles only, across one of the finest and most luxuriant countries in Europe, but which I shall not at present take upon me to describe, from its not containing any thing particularly interesting with regard to lithology, the prominent feature of the present work. I shall therefore return to Martignie, at the basis of the Great St. Bernard, in order to resume the route which leads to St. Gothard, a description of which will hereafter be attempted.

to St Gotthard, a description of which will hereafter be attempted.

At the base of the Great St Bernard, in order to resume the route which leads along the prominent feature of the present work, I shall therefore return to Aletsch, from its not containing any thing particularly interesting with regard to ichthyology, the prominent features of the present work. I shall therefore return to Aletsch, at the base of the Great St Bernard, in order to resume the route which leads

VALLEY OF THE RHONE.

UPPER VALLAIS.

DEPARTURE FROM MARTIGNIE.

HAVING experienced much fatigue on my return across the Great St. Bernard, owing, in great measure, to the different climates I may be said to have passed through in the same day's journey, according to the greater or less degree of elevation in which I found myself, never having felt heat more intense than on the one side of the pass, nor more suffocating than on the other, near the village of St. Pierre, though so cold on the top of the mountain,—I consequently decided on delaying, for a few days, my departure from Martignie, previously to pursuing my journey into the Upper Vallais, where I not only purposed tracing the Rhône to its source, but exploring the Mont St. Gothard, a pass no less tremendous than the former. This being my only view, I determined on taking sufficient time to visit that part of the country, and make my observations; and, therefore, I proceeded the first day no farther than Sion, the capital, only twelve miles distant from where I set off. On leaving Martignie, I took an eastern direction, and followed the road which leads along the bases of the mountains that screen the southern side of the valley, keeping near the banks of the swampy plain which here forms the bottom of the basin, whose width has been computed to exceed eight English miles.

This extensive surface, which gradually contracts towards the east, is crossed by the Rhône from east to west, and has every appearance of having been the work of that great river, which has formed it by the progressive accumulation of its sediment. This its soil very strongly evinces, from being in every respect similar to that which extends from Port Vallais, mentioned in a preceding chapter, to where the same river throws itself into the Lake of Geneva. Most part of the soil is, however, far less fertile than the former, producing generally but very indifferent crops of hay, filled with rushes or reeds, while only a few groupes of aquatic trees, such as alders, willows, linden or limes, are seen thinly scattered over this large surface. Yet, as the valley gradually

approaches the lateral mountains, and begins to rise by a gentle slope, the soil improves, and becomes more fruitful and well cultivated: and it must be acknowledged, that the inhabitants of this part of the Vallais, though much of the country still appears poor and miserable, spare neither pains nor labour to ameliorate the land, and to increase its fertility and value, either by digging deep ditches to drain off the water, or by constructing strong mounds or dykes to oppose the impetuosity of the river, in order to keep it in its proper channel. But, unfortunately, these efforts have not as yet been crowned with the success that had been expected, nor in all probability ever will, till the surface of the soil rises higher, or the bed of the river sinks lower,—alterations which time will naturally produce. For one of the greatest obstacles they have now to contend with, and which can in no wise be prevented, is the periodical overflowing of the Rhône at the melting of the snow from off the stupendous peaks that screen both sides of the valley in an extent of more than one hundred miles, which is the distance estimated from Martignie to the source of that river, at which time the rise of the water is so considerable and powerful as to carry away most of the barriers erected during the summer.

Besides, these dykes naturally forcing the water towards the opposite shore, each individual, desirous of preserving his lands, finds it impossible, without materially injuring his neighbour, which consequently brings on discontent, and becomes a source of disagreements, grievous impediments against the ameliorating of land, or any thing else. These disagreements, likewise, often create law-suits, and bring inevitable ruin on both parties, leaving the unfortunate spot either uncultivated, or else to be reaped by the attorney only, and thus too often realising the fable of the oyster and the litigants.

There are two roads which lead from Martignie to Sion; one that crosses the plain above mentioned, which may be considered a tolerable good summer-road, though unvaried in appearance, and intensely hot; the other, by which I directed my course, is pleasanter, and also more instructive, from its following the bases of the mountains that screen the southern part of the valley, as before noticed, and which are apparently all of schistus, or calcareous stone of the secondary order. Thus did I proceed till I reached Saxon, a village delightfully situated, and the first from Martignie; for the hills that surround its southern extremity, including those which lie on the other side, are extremely fruitful, exhibiting, almost every-where, a succession of extensive vineyards

and rich meadows, crowned with immense dark groves of firs and pines, which lose themselves in the permanent snow that covers the spiry peaks of the mountains, to which these hills may be deemed the first steps. Beyond this village, I remarked, on my right, a mountain, containing veins of a fine white gypsum, wedged in between thick strata of bluish schisti, in which were a kind of quartzose kidney-shaped stone, called by Wallerius *fissilis rudis reniformis*, spec. 4; but contiguous to the Rhône those same schisti are covered with calcareous strata, stretching considerably toward the south-east.

Having crossed this river, I soon reached St. Peter's, the last village at the extremity of the Lower Vallais; and here the right banks of the Rhône, which I was then pursuing, displayed on all sides landscapes no less fertile and pleasing than those I had before noticed on the opposite side; the vineyards, likewise, which lie in a southern aspect, yield a more excellent species of wine, both in quality and flavour, than that which is made in the environs of Martignie. The surrounding scenery was truly beautiful, and still animated by the active industry of the peasantry, who had not yet retired from their daily labour, but were, on the contrary, dispersed in straggling groupes over the adjacent fields, gathering in the harvest with unremitting alacrity. While some were reaping, and others busily employed in tying up the sheaves and making the shocks, or else assisting to cart, the aged were preparing the rustic feast beneath the shade of some large chesnut-trees, under the thick foliage of which the young men were promiscuously to assemble, to relax from the fatigues of the day,—forming, altogether, one of the most pleasing and interesting prospects imaginable. At no great distance from St. Peter's I crossed the Morgia, a river which takes its source at the foot of Mont Dungal, on the frontiers of Berne, and serves as a limit or division between the Upper and Lower Vallais.

Before passing this river, which in the environs of Sion occasions great damage, I observed the mouldering ruins of two ancient castles, hanging, as it were, on stupendous rocky peaks on the left side of the road, which, from their singular appearance, attracted my attention, and really exhibited a most picturesque *coup-d'œil*. Being anxious to gain information, and know to whom they had originally belonged, I found them, on inquiry, to be the remains of the famous castles of Montorsum and Leon, described by Simler in his History of the Vallais, the former of which had been destroyed, in 1416, by the inhabitants of the Upper Vallais, and the latter about the year

1376, by baron Antoine de la Tour, to whom, at that time, Montorsum belonged, as also much landed property in the Lower Vallais. This baron, in consequence of some dispute with Guichard Tavel, bishop of Sion, his uncle, who resided in the other castle, relative to some dues, determined to obtain the prelate's acquiescence by force of arms,—and accordingly, summoning his vassals to the field, he completely succeeded. But De la Tour, not yet contented, wishing to add cruelty to revenge, had the barbarity to cause the bishop and his chaplain to be thrown headlong from the summit of the highest tower, which, as just observed, stood on the top of an isolated rock of immense height. This horrid deed did not, however, remain long unpunished,—for the succeeding bishop, attacking De la Tour in Montorsum, the castle was soon taken by assault, and afterwards rased, or at least very nearly so, there being but little of its vestiges now extant.

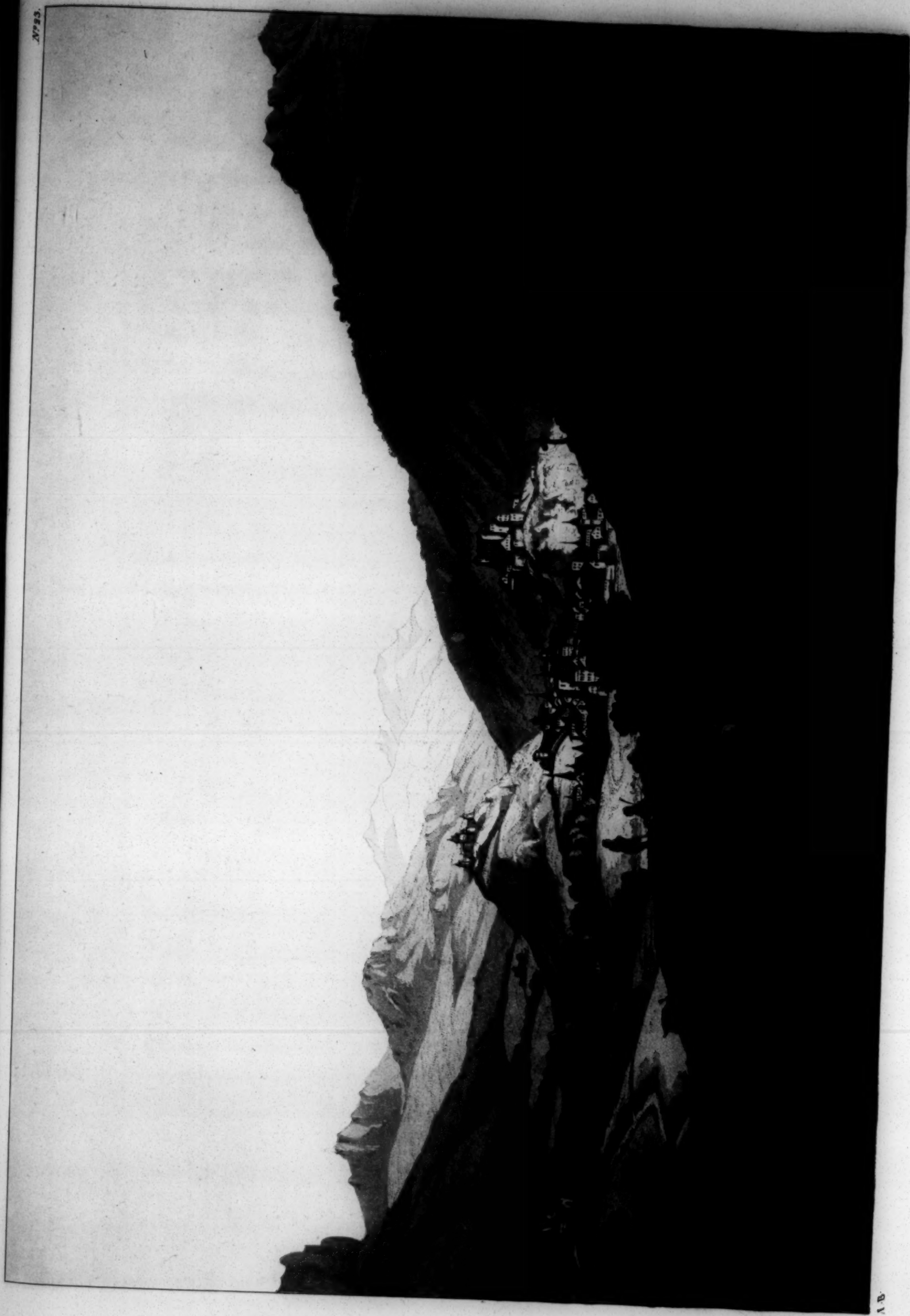
The baron's family was, in consequence, banished from the country, and their effects confiscated; and, previous to the French revolution, there were still some of his descendants settled in Savoy.

From Morgia I soon reached Sion, a city seated on the banks of the Rhône, and as it were in the centre of the valley, which is here tolerably well cultivated. It is likewise an episcopal see, extremely ancient, not extensive, but pretty regular: the streets are wider than in many towns; and it is surrounded by old walls, flanked by some Gothic towers, besides being farther defended by three forts or castles, which belong to the see, and stand on as many isolated rocks. (Vide N° XXIII). The first of these forts, called Majoria, originally served as a place of residence to the nobles of the city, named *majores*, but is now inhabited by the bishop; the second, Valeria, bears the name of a Roman lady, by whom it was built, as I shall hereafter explain, but at present is the residence of the dean and some of the canons, who form the chapter; and the third, Tourbillon, the highest of the three, from whence it derives its appellation, serves as a summer-retirement for the bishops.

This town, though by no means handsome, may certainly boast of its antiquity, having been the *Sedunum*, or *Civitas Sedunensis*, of the Romans.

Here have also been found, by the inhabitants, a number of fragments of vases, bass-reliefs, and inscriptions, among which is one, placed by the church-door, so far legible as to authorise a supposition that it must have originally belonged to some trophy erected in the year DCCXLVI of Rome, in honour of Augustus;—the words

2723.



A.B.

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"*Civitas Sedunorum*" are plainly discernible. And by another, at the Hôtel-de-Ville, we are made acquainted, that to the prætor Pontius Asclepiodotes the inhabitants were indebted for their churches, he having caused them to be built in the fourth consulship of the emperor Gratian. Finally, by a third, discovered near the castle of Valeria, it appears that the lady from whom it takes its name was a Roman, and mother to Campaneus, then præfect, or governor of the town, during the reign of Maximus, who, being killed in an action against the Gauls, had caused a mausoleum to be erected for him, of which this was the inscription, now placed on the wall of St. Theodule's church.

Though there is no doubt that the city of Sion ranks with those places which have considerably suffered by the barbarous hordes who formerly inundated Europe, as also by the wars carried on by the bishops, at different periods, against the neighbouring states, yet are there some few buildings deserving notice; as the cathedral, the *maison-de-ville*, or town-hall, which becomes curious from its antiquity; the bishop's castle, the public college, the hospitals, and many of the churches. Probably the number of steeples and towers may at first strike the traveler; and when he further looks round, and sees the monks and priests who swarm in most parts of the town, and in all societies, he will hardly need to be told that the chief magistrate of Sion is an ecclesiastic.

It may not, however, be amiss to inform him, that this bishopric is one of the oldest of ancient Gaul; and that among the bishops who assisted at the council of Macon in 585, the pastor of Sion was there, and at so early a period subscribed himself *Episcopus Seduni*. It also appears, from good authority, that, when the see was at Octodurus, the Vallaisan bishop at the council of Aquileia, in 380, signed himself *Episcopus Octodurensis*.

This bishopric was likewise originally suffragan to that of Tarantaise in Savoy; but, in 1513, cardinal Matthew Schinner, then bishop of Sion, obtained from the pontif Leo X. the prerogative of holding under, or being suffragan direct from, the Holy See itself. He is likewise honoured with the title of Prince of the Empire, besides those of Count and Præfect of the Vallais,—the latter of which confers on him the right of appointing, during any public ceremonies, a seneschal or high-steward, who carries before him a drawn sword. When a person is chosen to this see, he remains in it for life, without being translated to another; and when a vacancy happens, his successor must be chosen by the canons who compose the chapter, and the deputies of the *dixains*.

These canons are twenty-four in number; five of whom, with the dean, reside in the castle of Valeria, seven in the town, and the other twelve at the different cures in its environs.

At the election, the chapter and deputies are therefore called together, when the canons propose four candidates, taken from among themselves, one of whom is elected by the deputies, of whom there are seven, one from each commonalty, and then confirmed by a majority of votes of the general body. One of these deputies, who has the title of *landshauptmann*, or chief officer and captain of the country, when the election is determined, and the fortunate candidate installed, delivers into his hands a naked sword, as a token of his præfecture.

This prelate enjoys considerable privileges, although he has lost some within the two last centuries. He has, however, retained the power, with consent of the dizains, to coin the money of the country, bearing his own arms, with a sword for his crest; he can also pardon offenders, and make notaries, &c. but, with regard to the public administration of affairs, the chief officer of the country is indiscriminately appealed to as well as himself. Besides the title of præfect, he possesses for life manors and jurisdictions in the Lower Vallais, which are attached to the see. In fine, he is member and president of the supreme council, called in German *landrath*, that language being mostly spoken in the Upper Vallais. But, as to the form of their government, it may be described nearly as follows; viz. that the whole of the Upper Vallais is divided into seven great commonalties, called *dizains*, or *zindhens*,—six of which are under a popular or democratic form of government, and the seventh, which consists of Sion and its district, is aristocratical in its forms.

The popular dizains are Goms, Brieg, Raren, Visp, Leuk, and Siders, which have all extensive parishes, and open market-towns in their principal places, except Leuk, whose town is surrounded with walls. Each dizain has its particular court of justice, both civil and criminal, consisting of twelve magistrates or judges, with a superior officer in the chair, who is either mayor or châtelain. They have likewise a banneret, who is charged with the military regulations. The inhabitants of these commonalties assemble twice a year, to nominate their deputies to the general diet, or supreme council, held in the castle of Majoria in May and December. This diet is convoked by the *landshauptmann*, who has also the dignity of Grand Bailiff, over whom, however, the bishop presides.

This magistrate, who in some measure counterbalances the power of the prelate, is elected every two years, in the month of May, by a council formed of the bishop, two canons, and all the deputies.

In the assembly called *landrath* are decided all appeals from the *dizains*, as well as what relates to the Lower Vallais; in fine, it deliberates, discusses, and determines, *en dernier ressort*. It also gives audience to the foreign ministers, or *chargé-d'affaires*, sent from any of the European states, and is entrusted with the necessary regulations as to what relates to the military defence of the country; which, though composed of eighteen thousand militia only, is considered as amply sufficient, being in general picked men, chosen for their strength and activity, and who prove excellent soldiers. The police of Sion and its district is administered by a council of twenty-four, the president of which is styled *burgomaster*. The *châtelain* presides in the court of justice, is chosen from the class of bourgeois, and changed every two years. There is likewise the *vidame*, or judge of the bishop's temporal jurisdiction, chosen by the inhabitants of the city, who have enjoyed that privilege ever since 1560. To him is entrusted the singular custom of judging the civil and criminal causes during the nights only that the supreme council sits at the time of convocation; for which reason he is called *nacht castellan*, or châtelain of the night.

Having given, in as few words as I possibly could, an abridgement of the form of the Vallaisan government, a people deemed, by the chevalier de Bouffier, one of the most independent in Europe, where the men have the least changed their natural character, and the women their ancient *costume*, or manner of dress,—I shall pursue my narrative.

On quitting Sion, at the eastern part of the city, I remarked that not only the lateral mountains which screen the valley, but the isolated rocks on which the castles are built, consist of a kind of calcareous spathic stone, with wide veins, resting in many places on a species of indurated kidney-shaped schistus, which stretches toward the torrent Lienna, the water of which precipitates itself with great violence from the tops of mountains that are in the canton of Berne, and, by its impetuosity, causes much devastation to the inhabitants of St. Leonard, a small village through which I soon after passed.

About two miles from Sion, I began ascending the steep mountain of La Platrière, which is curious in respect to its composition, having at first a basis of fine-grained

calcareous stone, with strata scarcely discernible, very little inclined to the horizon, and containing no fossils. To this succeeded a bluish schistus, with thin laminæ of no considerable coherency, and covered to the summit by a number of strata of different-coloured gypsum; but, what is more remarkable, this same species of stone is equally conspicuous on the eastern as well as the western sides of the mountain, following the same order, and of similar corresponding thicknesses.

From the summit of this mountain the prospect is both beautiful and extensive, commanding a large tract of land, including not only the town of Sion and the course of the Rhône as far as Martignie, but even extending almost up to its source. An object among the rest, which to a geologist becomes interesting, is the number of small isolated hills, of three or four hundred feet above the present level of the Rhône, dispersed at the bottom of the valley, and forming, as it were, so many detached islands, the summits of which appear to indicate the elevation of the valley prior to the total retreat of the sea, and make it, doubtless, reasonable to suppose, that they owe their origin to the current of those same waters, aided since then by that of the Rhône, which, by imperceptibly furrowing their channel, have left these hills thus raised above the present level of the valley,—a supposition still more strongly evinced by their shape and structure; for the latter may be considered as being properly composed of heaps of fragments from the primitive mountains, covered by a thick vegetable stratum, and their shape that of a truncated cone. These hills, which are cultivated and wooded to their summits, are extremely picturesque, and exhibit the most pleasing variety of tints imaginable.

The town of Siders, or Sierre, the next place of any extent through which I passed, is well built, and the capital of one of the dizains. The houses are handsome, with a great appearance of cleanliness: consequently the crêtons and goîtres are much less conspicuous here than in other parts of the Vallais: in fact, the whole district is rich and fertile, both in vineyards and pasturage. Mineral coal is likewise found there; and in the lesser valleys, which terminate in that of the Rhône, are mines of copperas, pyrites, and silver ore of a greyish tinge, which have never been worked, though there are others of solid cobalt which have, and from whence the inhabitants, for a time, drew some little advantage; but, owing either to policy, or some particular reasons of government, they were never encouraged, and, of course, soon after totally abandoned.

The mountains which skirt the valley of the Rhône, from Siders to Leuk, or Leugg, are, with few exceptions, similar to those from Sion to Siders, the schistus only seeming to vary in coherency and thickness; and though the channel of the Rhône here gradually contracts, yet does it not prevent the view of a succession of rich fields and smiling meadows, situated at the bottom of the valley. The town of Leuk, which may be reckoned about twenty English miles distant from Sion, is the capital of its own district, which is less extensive than that of Siders. It is seated at the mouth of the torrent De La, where it throws itself into the Rhône, is surrounded by a wall, as already observed, and stands on an eminence which commands the eastern and western sides of the valley in nearly its whole extent.

The surrounding country exhibits an uninterrupted variety of pleasing and interesting prospects: but what is most extraordinary, and in fact ought to be seen by every Alpine traveler, are the famous baths of Loiche, which become remarkable from their situation, as well as the road made across Mont Gemmi, another lofty mountain, though still impassable for carriages. Being anxious to make this excursion, I arrived at Leuk in great expectation; but finding the weather unfavourable for the attempt, it having rained the whole day, I deferred my intention till the next morning, and then set off at a very early hour, that I might have more time to examine not only the baths, and the environs of the valley in which they are situated, but likewise the stupendous rocks of Albinen, which are nearly contiguous; for though the distance from Leuk to the baths be only nine English miles, yet, from the mountainous state of the major part of the road, one whole day is scarcely sufficient to complete that distance, and return to Leuk the same night.

Having, in consequence, furnished myself with a guide at the last-mentioned town, we directed our course to the mountain of Gemmi, which is in the vicinity of the baths, though rather towards the north. We first of all entered a contracted valley, at the bottom of which rolls the torrent De La, with such impetuosity, that the roar of its water oftentimes drowns the human voice.

This valley takes its name from the torrent; and, in the space of three or four miles, becomes so deep and narrow, that it appears as a perpendicular fissure only, through which the torrent continues rushing, at the extreme depth of two thousand feet beneath the road, exhibiting a frightful precipice, filling the mind with a mixture of terror and surprise, which is further increased by the tremendous noise of the water, re-echoed

by the lateral rocks. And surely nothing can be more surprising than the appearance of this very singular road or track, nothing similar to it having occurred to me in any part of the Alps: and truly wonderful it is, when we consider that it is entirely cut along the side of a steep fissure, forming, if I may so call it, a kind of zig-zag gallery, which descends to the bottom of the abyss,—for such is the idea conveyed when viewed from the summit; and, of course, it requires no small degree of fortitude to pursue it.

This road is in some places covered by the main rock, and in others by tufts of firs and shrubs, which grow between the strata of the same mountain, whose structure seems to vary considerably; for its top appears to be a soft tender schistus, succeeded by a species of calcareous stone, with inclined strata, which rest on others of a hard kind of horn-stone, nearly horizontal. Before the construction of this road or pass, which was made about fifty years ago by order of the Vallaisan government, and executed by the Tyrolese at great labour and expense, the access to those baths was very formidable, and could only be effected by means of ladders thrown across from rock to rock, till they reached the bottom of the precipice. At stated places, strong robust men were stationed, in order to convey the invalids who frequented the baths on their shoulders, thus carrying them down the ladders, having previously bound their eyes with a handkerchief, lest fear might have overcome their courage had they been sensible of the extreme depth they were taken to. Before I had scarcely reached half the descent, I perceived, in the gloomy vale beneath, some company, who were apparently returning from the baths, and formed a most singular and pleasing contrast to the wild and rude scene which surrounded them. On a nearer approach, I found them to be two English women of fashion, with their suite, in the act of ascending the mountain in such chairs or sedans as are used to cross Mont Cenis.

No sooner had I quitted this defile, than I began ascending another steep hill, previous to reaching the baths, which led me to a delightful plain, or basin, surrounded by lofty hills, but in which were several chalets, and a vast number of cattle grazing. In passing one of these rustic dwellings, before which some young people were seated on pieces of loose rock, and others, of different ages, busied in making lace, attending with glee the rural and harmonious sounds of the German clarinet*, on which two

* A kind of osier flute, of singular construction, used by the Tyrolese shepherds and German Swiss, from five to six feet in length, and about one inch and a half in diameter, as described in the Author's *Rhätian Alps*.

youths were playing,—struck with this well-known sound, I could not refrain stopping my career, to listen more attentively; on which, being perceived by one of the damsels, she instantly came to offer me a seat, and some milk to refresh myself, and with such innocent simplicity and modest courtesy as would have done honour to the most polished of her sex. I soon after quitted this happy groupe, who in all probability inhabited chalets belonging to some rich individuals of the Vallais; it being customary, in the Alps, to send a part of their family to guard the cattle during the time they feed on the high pastures, reserving the meadows which are nearer their habitation for spring and autumn,—a circumstance which accounts for the deserted appearance of many villages, both in the Vallais and Savoy, during the summer months; where the old and infirm, the curate, and a few individuals, who have lost their natural taste for simplicity in consequence of having visited other countries, and thereby adopted their habits and customs, are, literally, the only people that are to be met with.

The baths of Loiche, or Loncher-bed, as they are sometimes called, are nearly contiguous to the above plain, and situate in a valley, rich in pasture, at the basis of Mont Gemmi, though surrounded by lofty rocks, covered with permanent snow. This spot is furnished with a tolerably good inn, and several wooden houses, most of which are for the accommodation of strangers. Nearly in the centre of this little village is an extensive basin, which serves as a reservoir to the drain belonging to the superior springs, of which there are twelve, at about a mile and a half from the inn. But, what is singular, though these springs are placed at the foot of an immense rock, which serves as a support to the great glacier of Gemmi, yet, contiguous to their source, the state of their temperature raises the mercury in Fahrenheit's thermometer to one hundred and twenty degrees,—a circumstance which, had I not, in the course of my travels, seen molten lava running down the sides of Vesuvius when its summit was covered with snow, would doubtless have surprised me.

These springs, which altogether yield about five or six cubic inches of water, serve to fill four large baths, divided into four regular squares, capable of containing five-and-twenty or thirty persons each. The water has a strong sulphureous smell, which evaporates or loses itself if taken any distance. It is deemed efficacious for many complaints, as the spleen, hysterics, scurvy, &c. and is accounted a great strengthener of the stomach. But a most singular virtue which attends it, and which must not pass unnoticed, is that of restoring life and colour to flowers and vegetables, let

them be ever so withered or dead, when thrown into it; although, from the heat of the water, it might naturally be supposed to have a contrary effect; but so it is; and no other wise can I account for it, than from the particles of neutral and alkaline salts with which the water is impregnated. Close to the baths begins the ascent to Mont Gemmi, which is neither less curious nor wonderful than the former, being likewise cut in the main rock for the space of seven or eight miles, in a continual zigzag, and nearly every-where covered by the rock itself. This astonishing undertaking was completed by order of the states of Berne and the republic of Vallais, at the beginning of the present century; for, as this pass, which is as stupendous as the Great St. Bernard, is much frequented by the mercantile people of the country, and those who visit the baths of Loiche, these states found themselves equally interested in opening this passage, though still passable only on mules or on foot, owing to the frequent falling of some parts of the mountains that stand contiguous to the road; which circumstance has prevented it being entirely finished on the Swiss side.

This tremendous mountain is as curious in its construction as in the heterogeneity of its strata. Its nucleus appears to be partly granite, and partly quartzose, micaceous rock; but, what seemed most remarkable, near its summit I observed calcareous strata, of five feet thickness, in which were imbedded a vast quantity of fossils, mostly *cochliti* and *anomæ*,—a very convincing proof of the extreme height of the sea at the time it submerged our continents, since those same strata are now seven thousand feet above the present level of the sea. At no great distance from the top of the mountain is also found sulphur, vitriol, and vitriolic pyrites, besides a mine of silver ore, which is not worked, though apparently very rich: there likewise stands an hospital, but small; and a deep lake, the drain of which is unknown. From the highest part of the mountain, called Point Daubin, the prospect is both sublime and magnificent, for the eye wanders westward, on an extensive glacier, that stretches in an easy ascent for the space of five miles; while, on the opposite side, the whole length of the valley of the Rhône is distinguishable, with the Great St. Bernard at its head, Mont Velan, and the rest of the frozen chain which separates the Vallais from Italy, forming a noble aspect; whereas, east and north, the view totally changes, and all is desolate and melancholy; for nothing but immense fragments of rock, piled mountains high, one on the other, spread abroad, and strongly evince the dreadful convulsions of Nature which this mountain has doubtless experienced at some very distant period.

About two miles and a half from the baths of Loiche I gained the basis of rocks on which stands the village of Albinen, where ladders are placed, from rock to rock, in the same manner as were originally near the baths. This village, which is situate in the midst of an extensive plain or basin, nine hundred feet at least above the valley of Loiche, is large and populous, the inhabitants being healthy and comfortable; and though there is no other way of access to them than by the ladders above described, it is nevertheless much frequented; and, as a proof of what I advance, I shall here mention what I was witness to, and which may doubtless be depended on. At the moment I was preparing to ascend, I observed, five hundred feet above me, a woman, perched as it were on one of the ladders, carrying a pail on her head, and two youths following. From the extreme distance they were at, they had a most singular appearance, and might have been taken for birds rather than human beings; but from their alacrity and manner of proceeding, had I not known by what means they were reaching the summit, I might easily have conjectured that they were ascending a flight of steps. From this village I returned to Leuk by the way of Indene, a road by no means so pleasant or instructive as the one I had taken in the morning.

About two miles and a half from the village of Albin, where Indians are placed, there is a small village, which is situated in the same manner as were originally near the battle. This village, which is situated in the midst of an extensive plain or basin, is surrounded by a low wall of earth, and is a large and populous place, the inhabitants being healthy and comfortable, and though there is no other way of access to them than by the ladder above described, it is nevertheless much frequented, and as a point of what I advanced, I shall here mention what I was witness to, and which may doubtless be depended on. At the moment I was preparing to ascend, I observed five hundred feet above me, a woman, perched as it were on one of the ladders, carrying a ball on her head, and two young fellows. From the extreme distance they were at, they had a most singular appearance, and might have been taken for birds rather than human beings. Their form, their shape, and manner of proceeding, had I not known by what means they were reaching the summit, I might easily have concluded that they were ascending a flight of steps. From this village I returned, as I did by the way of ladder, and by no means so pleasant or instructive as the one I had taken in the morning.

DEPARTURE FROM LEUK.

CONTINUATION OF THE UPPER VALLAIS.

ASCENT OF SIMPLON.

IMPROVEMENT in natural history having been a great object with me in all my Alpine researches, the reader will pardon me if I inform him, that on my return to Leuk I immediately began to arrange my journal, and read over the observations I had made in the course of the day, selecting the different samples of coloured quartz, schorl, &c. collected during my excursion, in order to number them. No sooner was this done, and every necessary preparation settled for the continuance of my journey, which I intended pursuing the next morning, than I most unexpectedly saw an old acquaintance enter the room,—a Swiss officer in the Sardinian service, with whom I had been on a most intimate footing in Piedmont. He was now on a visit at his uncle's, where he had accidentally heard of my arrival, and kindly hastened to bid me welcome. My being thus greeted by a friend, in a country where I had not the most distant idea of being known, afforded me more than usual satisfaction ;—for friendship I regard as one of the first bounties of Heaven to man, and I receive whatever flows from this source with sentiments of more than common gratitude. Judge, then, how inexpressibly delighted I was, in my present circumstances, to hail the countenance of a friend, who was as willing to extend to me as I to partake of his attentions and kind offices, and who, from his knowledge of the country, was able to assist me with the most valuable information relative to my intended trip across the Simplon, Mont St. Gothard, and the source of the Rhône !

Having, in order to make some little arrangements, spent the evening with my friend at the inn, in spite of every solicitation on his part to accompany him to his uncle's, we parted, though not till he had obtained a promise from me to meet and breakfast with him, the next morning, *en famille*. Nor had I any reason to repent, for I was charmed with their society, received every mark of polite attention, and gained

much useful intelligence. They also used every entreaty to detain me longer among them; and I was at last obliged, after the most pressing entreaties, to consent to stay at least four-and-twenty hours longer, that I might partake of a ball which was to take place in the evening; it being almost an invariable custom in Switzerland, though more particularly in the Upper Vallais, to welcome strangers in that way,—dancing being also one of their most favourite amusements.

My friend's uncle, monsieur W , had been a colonel in the French service, and was a descendant of one of the most ancient families of the Vallais. He was tall, well made, had a military countenance, and, though he had bid adieu to the bloom of youth, being near threescore and ten, had retained that amicability and politeness which constitute the character of an old French officer, together with the genuine frankness and candour of a native of the Upper Vallais. This respectable veteran had likewise had, what may be deemed singular in the present day, a sufficient share of courage and fortitude, on the approach of age, not only to discard those dangerous passions which are in general the cause of the major part of our misfortunes, but even to relinquish the love of glory, and to attach himself to that of humanity alone;—in fine, the life of this Vallaisan Cincinnatus might be truly styled the wise man's eve; for, surrounded by a family that adored him, he was, without distinction, the father, friend, and relation of all, diffusing comfort to every one; a kind and faithful protector to the poor, and a firm counsellor or supporter to those who applied to him for advice as mediator. Never shall I forget the few happy hours thus spent, alternately in amusement and instruction, in this asylum of hospitality, which, could I have prudently done, should certainly have been lengthened; but, as I was decided on proceeding, I took leave of my worthy host and family on the following day, and directed my course to Brieg, and from thence to Simplon.

Nevertheless, previous to my departure, I found time to take the elevation of the Rhône, at the basis of the hill on which stands the town, which I discovered to be fifteen hundred and thirty feet above the lake, and eleven hundred and forty-six higher than Martignie. After satisfying myself as to this particular, I crossed the river on a curious covered wooden bridge (as are in general most of the Swiss bridges), and pursued the road along its left bank all the way to the other side of Brieg.

The mountains which here skirt the valley I again found to continue calcareous as far as the torrent Tortmann; but, immediately after, the hard species of schistus begin

to succeed, and the former stone is seldom seen, and then only in small quantities, except on some few partial elevations;—a circumstance I have frequently remarked in many parts of the Alps, and indeed, I may add, almost invariably; for, wherever the course or current of a torrent flows through a wide and deep valley, it may be assuredly considered as a limit or term of separation between two or more species of rock.

To these schisti succeeds a kind of horn-stone of great coherency; but which, on being wetted, emits a strong smell of sulphur and argil; after which appears a blueish micaceous lamellated rock, striated with quartz, with strata much inclined. In fact, this last species of rock serves as a support to thick strata of tuffa-stone, which form a hill of no inconsiderable height. To the decomposition of this stone, or rather concretion, (which effervesces with acids, and contains, in its analysis, acid forty-two, lime fifty-three, argil two, and water three) may, in a great measure, be assigned that horrid complaint which affects so many of the inhabitants of the Lower Vallais; for, as the Rhône traverses this mountain in different places, it must unavoidably be impregnated with some of the above particles.

This stone appears hedged in between two rocks of the secondary order; for on the eastern side, nearly contiguous to the town of Visp, they rest on a kind of green-tinged schistus, not unlike a lamellated *lapis ollaris*, or serpentine. In this rock, which is abrupt, and rises perpendicularly above the road to a great distance, there is an hermitage cut in the interior, fifty feet above the road, which is deemed famous, and much resorted to: the chapel, in particular, is extremely curious, being entirely cut in the main rock, as well as its cells,—the whole being the work of two aged friars, who had chosen this solitary asylum for their retirement. It is dedicated to the Virgin, and named St. Maria-hill. This part of the road is much contracted by the lateral mountains, and becomes so interesting, by the wild and romantic state of the country, that it may truly be deemed a seclusion so beautiful, tranquil, and uncommon, that the most troubled mind might surely there gain repose:—on me it had such an effect, that it recalled to my recollection the exact sensations experienced at the time I first entered the amphitheatre at Rome, where the deep silence and awful appearance which reigned around so nearly corresponded with the one that then existed in this tranquil vale, with this exception, that the silence in the former was interrupted by the plaintive cries of owls and bats, which now resort in numbers among the ruins of that

once beautiful edifice, or else by slow and melancholy notes of litanies and Stabat-maters, sung in unison by pilgrims; whom curiosity or devotion continually attract to that capital; whereas, the murmuring noise of the Rhône (which, from having here a vast declivity, forms a number of natural cascades) is the only interruption in this sequestered spot, and renders the landscape as worthy of the artist's pencil as of the pen of the most contemplative genius.

But what again augmented the effect of this singular and uncommon scene, in my way to the hermitage, to which there is no access except through bye-ways, which lead, in an intricate manner, up a few straggling steps hewn in the rock, I perceived three women and an old man proceeding towards the chapel with great apparent marks of devotion, chanting, in low and solemn accents, prayers to the Virgin, each carrying a lighted wax-taper, which at mid-day had a strange appearance.

Quitting this solitary but pleasing spot, I soon crossed the Vispa, a torrent which falls from the lofty mountains that surround Mont Rose, and in whose channel I could easily discern (there being then but little water) a quantity of fragments with their angles rounded, apparently of similar species to the calcareous phosphoric marble described in the Rhætian Alps, and the same that have since been named *dolomie* by the son of monsieur de Saussure, from the commander Dolomien, who was the first that made known the property of this species of stone.

Young Saussure, who follows his father's steps in his scientific pursuits, has, in consequence of having analysed this sort of calcareous stone, found that one hundred grains contain as follow;—viz.

	Gn.
Calcareous earth - - - - -	44,29
Argil - - - - -	5,86
Manganese - - - - -	1,40
Iron - - - - -	0,74
Carbonic acid - - - - -	46,10
Total - - - - -	98,39
Loss in the chymical operation - - - - -	1,61
	100,00

See monsieur de la Methérie's Journal de Physique for March, 1792, page 160.

Soon after crossing this torrent, I reached the village, which takes its name from, and is the capital of, the Dizains of Visp, which is about thirty English miles from north to south. This commonalty, though far in the mountains, is extremely fertile and rich in pastures, besides containing in the same valley, above the village of Stalden, some beautiful transparent rock-crystal, and amianthus, with parallel filaments or fibres. The latter is found, as it were, lying in veins within a species of a greyish *lapis ollaris*, soft to the touch, resembling the *lapis colubrinus mollior* of Wallerius, spec. 137, of which the people of the country make much use for various purposes, as it in time becomes extremely coherent. From Visp to Brieg, about six English miles, the road is good, the valley again gradually widens, and the lateral rocks singularly vary as to structure and form, though the most predominant appear to be a kind of schistus, containing yellow, brown, and white mica. Nearly contiguous to Brieg are the ruins of a wall, which seems to have formerly been flanked with towers.

These ruins, which descend from an abrupt rock, and stretch to the very banks of the Rhône, make it reasonable to suppose that the wall may have been of Roman construction,—an idea generally credited in the country, and by no means improbable, from the town of Brieg lying on the direct road to Simplon, a passage even at that distant period, in all probability, known to the Romans.

The ascent of this mountain being one of the chief objects I had in view on quitting Leuk, I lay that night at Brieg, reckoned one of the best towns in the Vallais. Its population is great, the streets of tolerable width, and many of the houses built of stone, though the major part are of wood; yet, upon the whole, this town may be considered as much improved within these few years. The Dizains itself is assuredly one of the most fertile in the republic, although its situation be so elevated, as clearly appears from the height of the Rhône, which flows close by the town, and which is two thousand one hundred and sixty feet above the lake of Geneva. Its inhabitants breed much cattle, which they dispose of to the Milanese and Piedmontese, with whom they carry on a great traffic, not only in that particular article, but also in cheese, thus turning to profit the convenient situation of their town. Brieg is much resorted to, from being seated, as before noticed, on one of the most frequented passes of the Lepontine Alps, and being of easy access on the side of Switzerland, with an excellent foot road both ways, kept in repair by the neighbouring states. I shall now enter on a slight description only of this mountain, particularly including the part

that lies between the last-mentioned town and its summit, it being, in some respects, very like the Great St. Bernard, though less barren, and not so elevated.

This pass, called Simplon, or Sempelon, which, as just stated, is on one side easy of access, by a good and pleasant road, may certainly be deemed the least formidable of the Alps, next to that of the Brenner in the Tyrol; though so far similar to the rest, that it cannot be made passable for carriages, because of its extreme abruptness on the side of Italy, an invariable circumstance in every part of the Alps, as before noticed. On leaving the town of Brieg, which is situated at the entrance of a beautiful valley watered by the Saltana, the road lies partly on the banks of the Rhône, keeping a southern direction, and partly across thick forests or groves of larch and fir, intersected by rich and smiling meadows, for the most part watered by a number of small rivulets, whose limpid streams descend, with gentle murmur, from the summit of lofty mountains, wooded to the very top, which serve as a basis to the pass of Simplon. The high road thus continues, without much ascent, to the village of Tavernettes, nine miles from Brieg, where every necessary refreshment may be procured, prior to encountering the steepest part of the mountain, which is reckoned to take up an hour and a half from thence to the summit. Just before reaching the above village, I suddenly heard a violent noise, and at once saw, rushing from a forest, a vast concourse of people of every age and sex, armed with forks, spades, clubs, guns, &c. shouting with all their might, and running as fast as their feet could carry them. In an instant they passed me, turned the angle of a meadow, and vanished, like lightning, into another forest. Supposing they were in pursuit of a wolf, yet desirous of knowing the particulars, I hastened towards an old woman, who was standing close to the road, at the door of a cottage, who with grief confirmed my suspicion; telling me, that as her grand-daughter, a child of ten years of age, was tending their little flock, she saw a wolf take one of them; but that, unable to prevent him, she had only been able to run and give the customary alarm, which had collected the people I had seen, who were chiefly composed of their own family and the neighbouring cottagers, and who were in hopes, by their noise, to make him quit his prey, as he had just been seen with it on his back. These animals, who are in fact so formidable, and may at all times be said to annoy the inhabitants of the Alps, become yet more so when the tops of the mountains are covered with snow; for, being thus forced by hunger, they descend into the plains, and dare even make their appearance in mid-day, enter the cottages most contiguous to the forests, force their

way into the stables, where the flocks are kept in winter, and thence forcibly carry off the sheep.

But what is still more horrid to relate, yet a circumstance I perfectly recollect, though at that time quite a child, when at the village of Vouaches in Savoy, where my father had a house, a wolf, during public service on the Sunday, entered a cottage through the window, the door being fast, and ran off with a beautiful infant, that lay asleep in its cradle. Being, unfortunately, the only one who had witnessed this horrid catastrophe, ere I had aroused the village, time elapsed, and the babe was seen no more. Though many years have now passed since this melancholy event took place, never can the horror it occasioned, or the cruel idea of my insufficiency to preserve what might have proved a blessing to its family, be erased from my memory. The inhabitants of these mountains are therefore necessitated to be continually on the look-out during the winter months, and keep themselves provided with fire-arms, &c. for the government, by way of encouragement, give a stipulated price for every head of that animal, as formerly in England, though unfortunately not with similar success, from the utter impossibility of destroying them totally, owing to the situation and extent of the country.

But, to return to Simplon. This mountain is six thousand five hundred and seventy-nine feet above the level of the sea, consequently about fourteen hundred and twenty less elevated than the Great St. Bernard, and wooded nearly to the top. I found the rocks from Brieg to Tavernettes, for the most part, formed of calcareous micaceous stone, though, in many places, strata of a tender or soft schistus, of a bluish tinge, with an inclined direction, appear to be conspicuous: but from this last village to Dovredo, situate nearly at the basis of Simplon, on the side of Italy, they are of lamellated rock, containing quartz, mica, and feldspath. In descending the mountain, prior to reaching Simpelendorf or Simpelin, I remarked, as I went along, several thick banks of granitell, in which were schorl, quartz, mica, and steatites, of considerable consistency, whose strata were nearly horizontal. It is however certain that this species of compound rock does not resemble, by its spots, the genuine or true granite, the spots being infinitely more regular, smaller, and closer to each other: hence I have been led to believe that its crystallisation has been effected at a time when the bodies, or molecules, of which it is composed, were in a state of dissolution, and held, as it were, *in equilibrio*; for then the most similar parts, attracting each other, united by the surfaces that were most analogous to each other.

I again observed, at no considerable distance from this village, thick calcareous strata of white stone, lying on a species of rock that does not effervesce with acids. But the most remarkable circumstance was, that the above strata are in many parts covered by that same non-effervescent rock. All these facts, added to others which I have not deemed necessary to dwell upon in the present work, will, I flatter myself, serve, on a future day, to support my opinion relative to the formation of our continents, valleys, and lakes, as well as on the periodical change experienced by the sea at different periods of time. From Dovredo to Domo d'Ossola, a small town situated at the basis of Simplon, the distance may be computed at about nine English miles. This town belongs to his Sardinian majesty, and is nine hundred and forty-two feet above the level of the sea, consequently twelve hundred and eighteen less elevated than Brieg, which is seated north of the pass,—a circumstance that most assuredly corroborates very forcibly what has already been suggested concerning the great degree of abruptness and depth which in general prevails at the head of all villages in the Alps that terminate on the side of Italy, comparatively to what they have next to Switzerland and France.

As I had no intention, when I set out, of descending into the plains of Italy, I proceeded no further than Simpelendorf, and from thence returned to Brieg, where, on account of the length of that day's journey, I remained the following in this once ancient capital of the *Viberi*,—a people who, in the time of the Romans, inhabited that part of the Lepontine Alps. Many of the churches and houses here are really handsome, being ornamented with pilasters and columns of a species of *lapis ollaris*, of a deep green colour, with blue and yellow spots, fine-grained, and soft. This species of stone, which is a true serpentine, and cannot be injured by fire, is found in a quarry near the Rhône, half a league from the village of Arnem, and is used by the inhabitants of the country for stoves, in like manner as those of Lides. I then crossed the Rhône on a stone bridge, at no considerable distance from Brieg, and soon arrived at Naters, an extensive village included in the Dizains of Brieg, where, on a stupendous micaceous rock, striated with quartz, are still extant the ruins of the castle of Flue, now belonging to the bishop of Sion; but, from its having originally been in the possession of a family which has acted so conspicuous a part in the history of the Vallais, I am tempted to annex some few facts relative to it.

This ancient family of Flue, or Super Saxo, one of the most powerful of the republic, viewing with jealousy and discontent the bishop's ascendancy, raised against the see,

for a series of years, much trouble and inquietude; till at last, having gained sufficient influence, it caused the famous cardinal Matthew Schinner, the then bishop of Sion, to be expelled from the Vallais, at the close of the sixteenth century. Nevertheless, this prelate, who was no less active than ambitious, possessing eloquence and a most intriguing mind, who had likewise unfortunately promoted the shedding of much of the Vallaisan blood in useless military expeditions in the Milanese, soon found means to reinstate himself in his diocese, and, by way of retaliation, expelled, in his turn, this very family of the Flues, and took possession of their estates. These internal dissensions, added to the abuse of wealth and power enjoyed by many individuals of the country, frequently roused the people, and at last forced them to have recourse to violent measures, which were of some continuance; during which, the following singular custom was for a time established. To procure redress of their grievances, they first placed a figure, representing the country, meanly dressed, and with a dejected countenance, in one of their most frequented streets or squares, round which the multitude assembled from every part, and, addressing themselves to it with eagerness, inquired as to the cause of its wretched and miserable appearance; when a person styled *Procureur du Peuple*, or the People's Advocate, previously instructed for the purpose, in a long and strenuous harangue, answered for the figure, pointing out the grievances under which the people laboured, the mode of redress, and the individuals who were the apparent authors of their calamities: during which time, an immense billet (by them called *maze* or *massue*) of wood being erected, each malcontent, as he approached, drove in a nail, by way of engaging himself to see public vengeance properly executed. This *maze*, or *massue*, was then carried and placed in the front of the house belonging to the magistrate or noble deemed culpable by the people, who in general, from instruction being given him, was so fortunate as to make his escape in time, when the populace, in order to make amends for not finding him, regaled themselves at his expense, and too often ended by demolishing the house and every thing belonging to it. These arbitrary acts, and kind of ostracism, not unlike those witnessed in our time, but which justice and law have at last fortunately crushed and put an end to, were soon after terminated by the mediation of the Swiss cantons, where no such custom existed.

Now to proceed on my route.—I first began to remark, a little beyond the bridge of Naters, some large pieces of granite lying in the bed of the Rhône, most probably carried hither by the Massa, a torrent which precipitates itself impetuously from the top of

Mont Antonius, which may be deemed a part of the Schrekhorn, at the northern extremity of which stand the immense glaciers of Grindelweld, which extend considerably above the valley of the Rhône. Having here crossed this torrent, I perceived, nearly contiguous to its channel, a hill, which gradually rises towards the north, apparently composed of a species of pudding-stone of great coherency, with a cement composed of silex or siliceous matter, consequently capable of effervescing with acids. These stones, which lie in thick strata, appear similar to those which constitute the isolated rocks noticed in the neighbourhood of Lausanne. The valley then contracts so considerably, that in many parts there is scarcely sufficient room for the course of the Rhône, and the road, which on that account has been hewn in the main rock, that still continues lamellated, containing quartz and mica.

On the other side of this defile there prevails, throughout, a very conspicuous disorder and confusion in the strata, form, and structure of the mountains that bound the valley; and, at the same time, their species are so varied, that it would be impossible to give a minute description of them. I shall therefore confine myself to observing, that the schistus is most predominant, with strata invariably forming deep zig-zags; whereas, in other parts, that same species of stone forms lofty mountains, divided from their summits, with their bases covered by fragments and immense loose blocks of rock, on which grow a few shrubs and stunted trees. But what seems more strongly to evince the remote period of time at which this convulsion of nature may have happened, is the vegetable stratum of earth, ten inches thick, which now covers the greatest part of these stones: yet, advancing more towards the east, the cavities that exist between those huge schisti and micaceous rocks are every-where filled with sand, pebbles, and different fragments belonging to the primitive mountains, and also covered over by a thick stratum of earth, which forms some most excellent meadow-land,—another very forcible proof of the works of the sea at its sudden retreat.

This kind of disorder, so visible in the arrangement of the lateral mountains, evidently continues to the neighbourhood of Lax, a village included in the Dizains of Goms; and then stretches, not only to the hill on which this small place stands, but towards the town of Niderwalde, nine miles distant, where the mountains are in general composed of similar species of stone, and the same kind of fragments, except a few, of micaceous compound rock. The country is here again so extremely elevated, that trees are scarce, exhibiting only a few stunted cherry, plum, and other trees,

thinly scattered; though, nevertheless, at some little distance from Bisingen, the valley contracts anew, and vegetation, of course, becomes more animated. The road then continues beautiful, passing through meadows and forests, intersected by fields of hemp and rye, as far as Munster, the capital of Goms, twenty-seven miles from Brieg.

SOURCE OF THE RHONE.

GLACIER OF THE FOURCHE, OR FURCA.

MONT ST. GOTHARD.

RETURN TO MUNSTER.

MUNSTER, or Monasterium, one of the chief places in the Dizains of Goms, or Gonches, is pleasantly situated in the midst of a large fertile plain, sheltered from the bleak northerly winds by Mont Grimsel, and stretches along the banks of the Rhône. This commonalty, though occupying a high elevation in the Vallais, is extremely populous, and extends about thirty English miles from east to west, and sixteen from north to south, being terminated by the frozen summits that border the valley at those two extremities.

It is likewise divided into upper and lower districts, or parishes, of which the mayor, or chief magistrate, is alternately chosen, every year, by the inhabitants of those districts.

Munster is called the metropolis of the upper, and Arnen that of the lower, which is a pretty town, well built, and its environs rich in pastures. The inhabitants of the former are closely allied to the Swiss cantons of Uri, Underwalden, and Lucerne, by a treaty made in 1416, at which time the privilege of perpetual *bourgeoisie* was conferred on them, by way of compensation for the great services they had rendered to those cantons, in the wars they had to sustain against their neighbours.

The people in this part of the Vallais are much more religious than the rest; for which reason they have gained the appellation of Catholic, though the whole of the country be of the same persuasion; and, what is more singular, each dizain has its appropriate epithet; as, *Sedunum Caput*, or Sion the Head; *Serrum Amœnum*, Siders the Agreeable; *Leuca Fortis*, or Leuk the Strong; *Rarorum Prudens*, Raren the Prudent;

Vespia Nobilis, Visp the Noble; *Briga Dives*, Brieg the Opulent, or rich; and *Gomesia Catholica*, or Goms the Catholic.

In the latter of these dizains they are tolerably easy in their circumstances, living in considerable comfort, though their habitations be only of wood; but they are so neat, convenient, and simple, that they at once reconcile you to them. Their appearance is likewise striking, being in general painted red. The upper part of the house serves for the abode of the family, and the lower is converted into stables or hovels for the cattle. Yet are the generality of these hovels so constructed, that in the long and tedious winter evenings they afford the inhabitants a warm and comfortable retreat; the cattle being placed on both sides of the building, separated by boards, leaving the centre clear for the family, under which runs a rivulet that carries off all dirt, filth, &c.

The costumè or dress of the country, for both men and women, is extremely neat and unaffected: they pique themselves on the fineness of their linen, which seems to be their greatest luxury.

This is also the only province of the Vallais where I did not perceive any goitrous appearances; for the men, on the contrary, are strong, robust, and courageous, prizing their independence above every other consideration, and practising, indiscriminately, the virtues of hospitality to every stranger who appears deserving of attention;—circumstances which, though they may at first surprise, are certainly not so astonishing in a people whose natural simplicity of morals, situation, and character, cannot be supposed to esteem or love what they are not acquainted with; that is, those pretended advantages so eagerly sought after, and held in such high estimation, by nations who style themselves polished, as a compensation for the loss or privation of their liberties.

The Vallaisans, being ignorant of what may be called imaginary or capricious wants, are perfectly contented with what they possess, and neither covet nor envy their neighbours' property; on the contrary, they are solicitous for each other's society, and encourage no ambitious desires: for surely no doubt can exist, that the fatal causes of suspicion and secret animosity, which too often prevail among the generality of mankind, though more conspicuously in countries where wealth and opulence are most predominant, in great measure originate from covetousness and ambition,—vices which invariably increase in proportion as the desires of our imagination assume greater ascendancy.

I was much surprised at not having seen any beggars since my departure from Sion,—a circumstance which I had by no means expected; and, of course, I was naturally

induced to search into the cause; therefore, finding my host communicative and tolerably intelligent, I pitched on him as a proper person to address my questions to on the subject.

In consequence of my interrogatories concerning the method pursued by their magistrates to suppress so great a nuisance, and at the same time to relieve real indigence, he informed me, they had no beggars in the Upper Vallais who could properly be styled such; for, as they had no considerable fortunes in the country, luxury was consequently unknown, and each individual, perfectly satisfied, indiscriminately possessed his house, or *chaumière*, on different parts of the mountain, with a small garden adjoining it, and the privilege to send his cattle, for four or five months in the year, to graze on the pastures scattered in various parts of the Alps, in like manner, I may add, as the poor in England send theirs to heaths and commons; but that, with regard to the most common necessities of life, such as corn, for example, which they deemed their dearest or most expensive object, the inhabitants of the republic, the population of which is estimated at nearly one hundred thousand souls, so contrived it, that from breeding much cattle, which they dispose of, as before mentioned, to the Piedmontese and Milanese, and their wants being few or limited, they in reality received more money from Italy than was sufficient for the purchase of different kinds of grain for their own consumption; that in each dizain there were likewise public magazines or granaries, and that, in time of scarcity, the government, who allowed persons of every description to purchase the corn they wanted, distributed a certain quantity to the poor or indigent, in proportion to the number of persons in their families; that these had also permission to have that corn ground, gratis, at the *moulins banaux*, or public mills, and afterwards baked at the ovens, kept open for that purpose*.

And here it may be necessary to observe, as there are many who may not be acquainted with the circumstance, that in the Vallais, as well as in Switzerland and Savoy, it is an invariable custom, in all towns and parishes, to have similar mills and ovens erected by government, who let them out to private individuals. These ovens are heated every two or three days, according to the population of the adjacent

* Reflecting on this circumstance last winter, when corn was so very dear in England, and the poor in the greatest distress, I could not but wonder that a nation so wise and considerate as the English are allowed to be, did not adopt some plan of this kind, and why the parliament did not pass an act, ordaining that there should be established, in every parish throughout the kingdom, a public mill (either water or wind) and a public oven. This would be a great relief to the poor.

villages and hamlets, and in time of dearth or scarcity the poor are exempt from paying any thing whatever for baking their bread ; but the rest of the inhabitants are taxed at the rate of one penny for the baking of a loaf weighing twelve pounds, which certainly cannot be deemed a grievous exaction.

The mills and ovens are also superintended by a syndic, or magistrate, assisted by inferior officers, called *valets-de-place*. The business annexed to this office is extensive, as it includes the butchery and examination of every beast, previous to its being killed, in order to prevent improper meat from being offered for sale. These customs may surely be pronounced excellent, and of general utility, tending to the relief of the poor in particular, as well as beneficial to the community at large : is it not, therefore, greatly to be wished, that something of the kind were adopted by other nations, where a too great disproportion of wealth naturally occasions much poverty, and where the pecuniary assistance afforded to the poor is too often entrusted to the care of men who, from indolence or mercenary motives, acquit themselves improperly of a debt which is due to every distressed individual, and who, unfortunately, often consider it rather as an object of private interest to themselves, than as a meritorious act, dictated by duty, humanity, and religion.

Having left Munster early the next morning, I reached Ulrichen at sun-rise,—a village famous, in the history of that country, for the two memorable battles fought there in 1211 and 1419, for the establishment and independence of the Vallaisan republic.

The original field of battle has ever since been inclosed with palisades, as if to prevent the profanation of a spot which has been so dearly purchased by the blood of their ancestors. This inclosure, which can no more fail of inspiring every philanthropist with sentiments of respect mingled with regret, than a view of the Straits of Thermopylæ or the Plains of Marathon, is extensive, and at present covered with a number of wooden crosses, on which are written or engraved many of the names of those who fell distinguished in both actions. The inhabitants of this dizain, as well as those of most of the others which constitute the Upper Vallais, continue to commemorate, by an annual festival, the first of these victories, on which day the barriers are opened. When the old men, women, and children, in general assemble, and while the former show the young, who flock around, the names of those who fell in their country's cause, they hear of deeds which fill their hearts with every sentiment of respect, and thus imbibe, in their earliest youth, a proper love for their country and for freedom, which still

inspires the aged in this recital, though verging near the tomb. The mothers, on their side, like true Spartans or Thespians, animate their children with that degree of emulation and courage so necessary to support, in case of urgency, their happiness and independence.

Leaving this kind of Thermopylæ, with my soul full of tenderness and admiration, I directed my course towards the east; and, after four miles easy ascent, reached the village of Ober-gestelin; and thence proceeded to Ober-weld, three miles further. This last, which is one of the highest, in point of situation, of any in the Upper Vallais, is extremely gloomy or melancholy, the atmosphere so rare, and the winters so long, that on all sides nothing but immense pastures for the grazing of cows and sheep are seen, without a single tree, except some few stunted firs and larch, with here and there a bush of holly.

The whole soil from Arnen, the capital of the lower district, to Ober-weld, an extent of a dozen miles at least, is tolerably regular, having no considerable ascent, and apparently composed of fragments belonging to the primitive mountains, pebbles, and sand, covered by a stratum of vegetable earth of about six inches thick.

I have therefore not the least doubt, from every appearance, that the whole of this part of the Vallais owes its origin, and the present level of its surface, to the successive sediments of the sea, as likewise to its last retreat, which was slow and gradual, or, in other words, since the formation of the great valley of the Rhône, as mentioned when speaking of the formation of the Lake of Geneva: for it is necessary to observe, that the opinion I have suggested on this subject must not be forgotten; viz. that, from the observations I have made, I am led to suppose that this valley, as well as that of the Arve, both of which seem to have originated from the sudden fall of the vaulted roof of some extensive caverns, occasioned by internal commotions of the earth have, in process of time, become the principal channels in this part of the Alps for the draining of the sea at the epoch of its retreat, but that it doubtless remained there a length of time after the total drying-up of the greatest part of our continents.

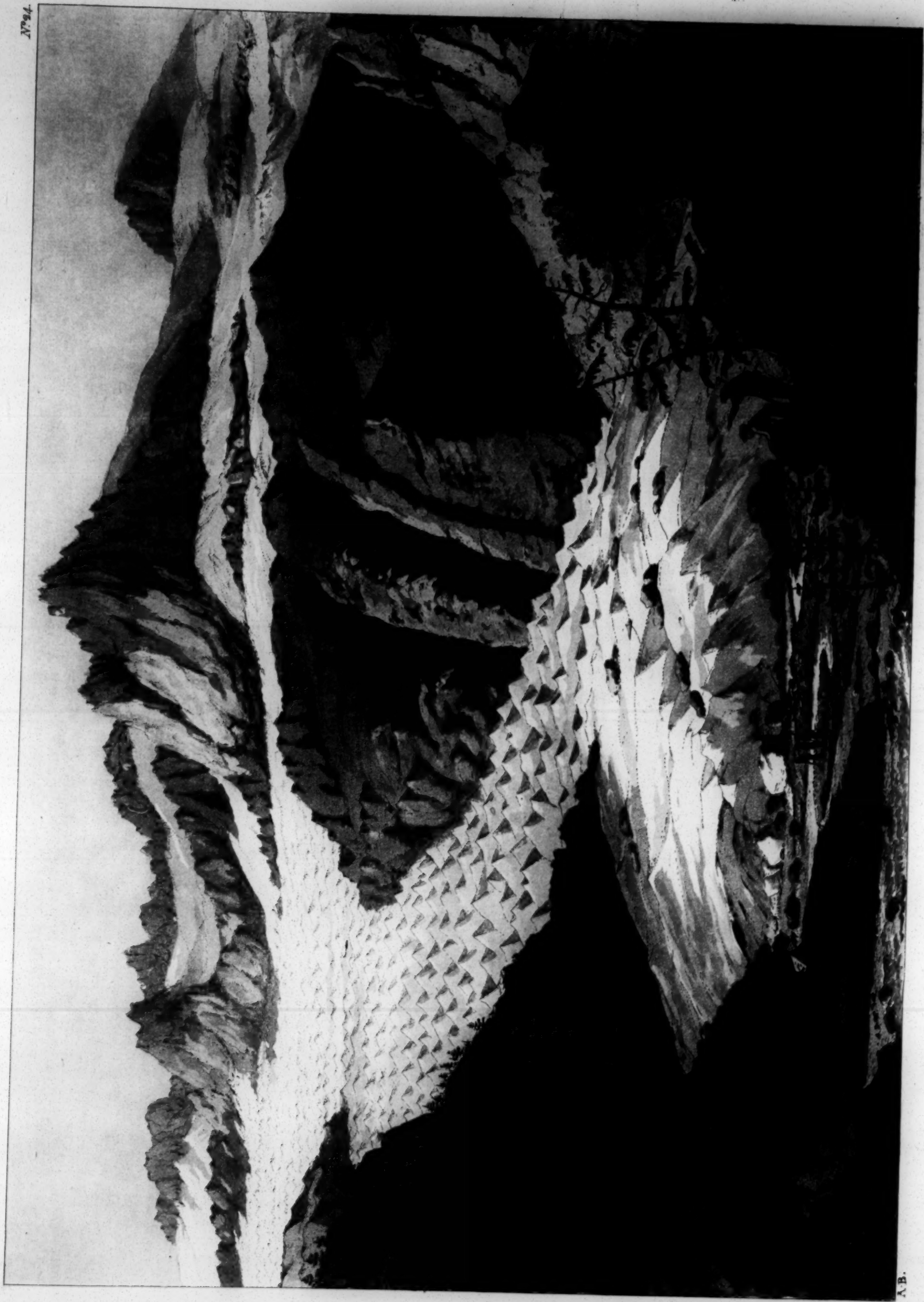
On the other side of Ober-weld I began to ascend a narrow valley, at the bottom of which the Rhône flows with great rapidity. The hills which border this valley and river are mostly schistus, containing a large quantity of thin lamellated mica, of different colours, which are all nearly vertical. Between the schisti are veins of a species of white granulated quartz, mixed with a kind of brown mica, which is, as it were,

cemented with the other grains of the rock, resembling the *quartzum granulum coherens* of Wallerius, spec. 105. Then, continuing along the same valley, for the space of five English miles, by a rugged stony path, tending in a direction from north to south, I unexpectedly gained a *plateau*, or elevated flat piece of ground, which commanded both the valley and the source of the Rhône: here I could easily discern, through a wood of larch, which covers the *plateau*, and shelters it from the north wind, the extensive glacier of La Fourche, or Furca, called also Glacier du Rhône, from its being supposed that a part of that great river issues from beneath the glacier,—which may in some degree be the case, though it certainly is not the entire or real source of the Rhône.

The prospect from hence is beautifully grand, and one of the most noble of the kind I ever saw,—a description of which I shall endeavour to attempt, though difficult; for the objects, in general, appeared of much greater magnitude than even those of the Glacier des Bois, near Chamounie, and the adjacent mountains considerably more lofty and majestic than those which surround the glacier of Grindelweld, in the canton of Berne.

In the drawing N° XXIV. I have given as exact a representation as possible of this astonishing *tableau*, from the outlines taken by myself on the spot, and which are such, I may venture to assert, as they really appeared to an eye which is desirous of letting nothing escape that deserves attention. I may therefore add, that this superb glacier, of which a stranger can form no idea, and of the magnitude of which, as well as the surrounding rocks, I am sorry to add, my drawing gives but an inadequate conception, may be compared to an extensive amphitheatre of ice, whose steps are more than three hundred feet in height, forming so many stupendous transparent pyramids of crystal, reflecting on all sides the beams of the sun.

These pyramids, or spiry peaks, are likewise arranged and piled, as it were, with so much art and exactness, one above another, raising their lofty summits towards the clouds, that their appearance is beyond conception. This glacier is situated at the eastern extremity of the Vallais, and is nearly surrounded by a long chain of stupendous mountains, that meet or join above this sea of ice, as if to form, by their junction, the Mont St. Gothard, whose basis is in part covered not only by this glacier, but also by others of nearly the same extent. Its north-eastern side may be said to be supported by the Furca, a mountain so called from the form of its summit, which terminates in

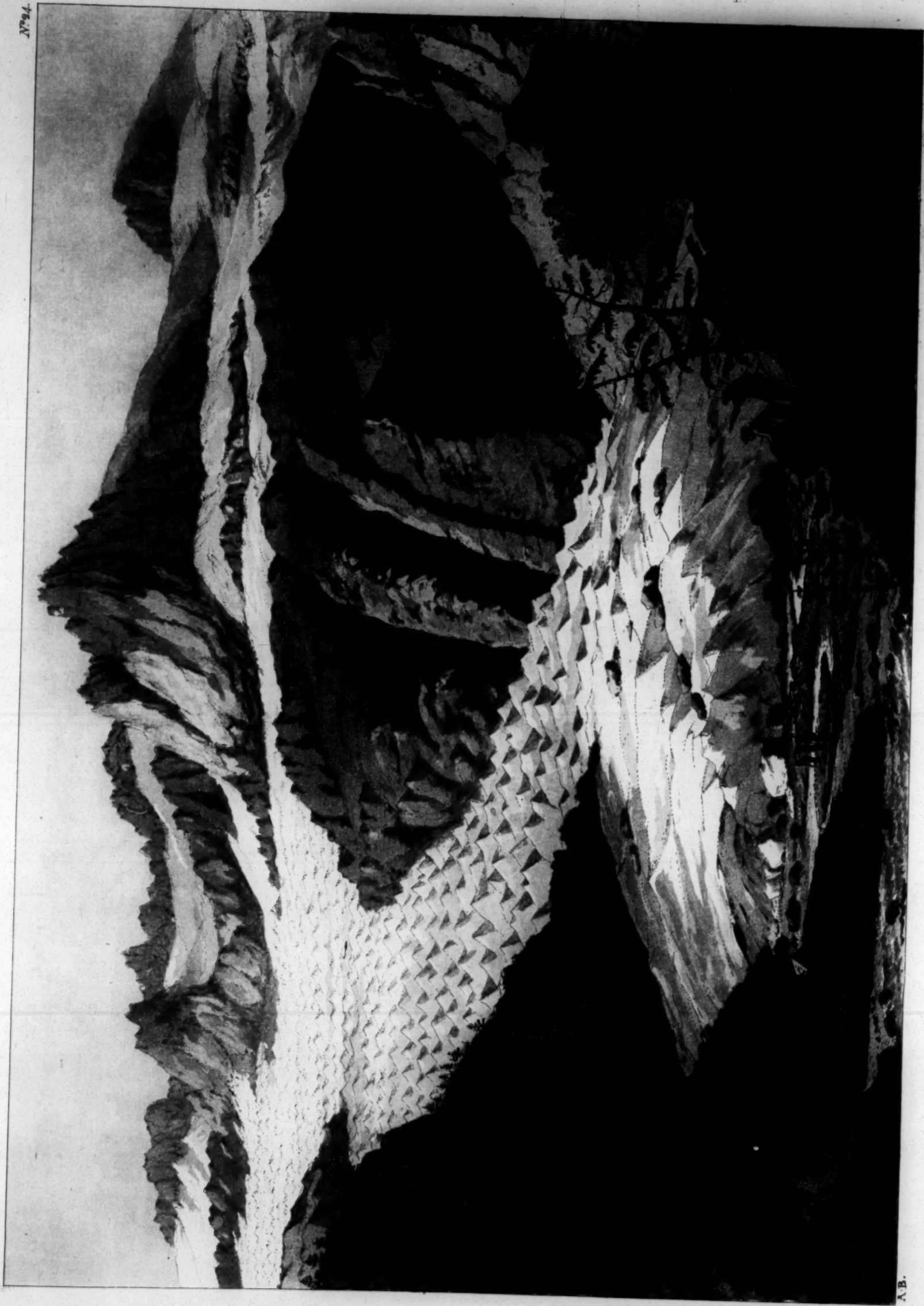


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two spiry needles, or prongs, not unlike a fork: it is also nearly every-where of granite, and serves as a limit to the states of Berné, Uri, and the Vallais, forming part of the chain of the St. Gothard.

The glacier rests its north-western side against the Grimsel, another lofty mountain, whose height is so considerable, that its summit is covered with permanent snow; yet there has been a road made, passable three months in the year, for mules and foot-travelers, from the Vallais to Berne. There is also an hospital nearly contiguous to its summit, free of access, similar to that already described; but the severity of the weather obliges the friars to quit their dwelling at the approach of winter, when the chief, or *hospitalier*, previous to his departure, takes care to leave a certain quantity of wood and provisions, in case some unfortunate traveler may still be on the pass, and need assistance.

The Grimsel, which is also a limit to the states of Berne, is rich in crystals, and is totally of granite, exhibiting, opposite or next to the glacier, bare or uncovered masses, as if imbricated the one in the other, like the leaves of an artichoke.

The celebrated Haller, who has favoured the public with a description of this mountain, in his valuable work on the Alps, mentions having seen a crystal taken from one of the caverns, formed between these immense blocks of granite, that weighed upwards of six hundred and ninety-five pounds. As for myself, though I cannot say so much, I have indeed seen several at Munster which were beautiful, weighing about twelve pounds and a half; and one in particular, which appeared to be extremely curious and valuable, of eight pounds weight, of a violet colour, one point only, and of hexagonal form, not unlike the *crystallus hexagona rubescens* of Wallerius, spec. 110.

The basis of this mountain becomes still more interesting from its contrast, throwing additional beauty and whiteness on the glacier itself; for, though its summit be covered with snow, yet, from its sides and basis being wooded, the trees form, by their dark foliage, an admirable and pleasing contrast to the transparency and brightness of the pyramidical spires; besides, the number of natural cascades that fall from its summit, whose limpid and silvery streams are seen precipitating from rock to rock, though reduced to vapour, among the tufts of firs and larch, ere they reach the bottom, wonderfully increase the beauty of the landscape.

On the sides and basis of the glacier above described are extensive moraines, or accumulations of decomposed granite, mixed with other fragments detached from the

stupendous rocks that screen its northern part. These accumulations, which insensibly increase, seem, in a great measure, to owe their origin to the small degree of melting, or thawing, which the surface of those frozen pyramids experiences during two months in the year, at which time the water that drains from thence carries with it the many small detached fragments that lie scattered on their sides, and deposits them at the foot of the glacier.

Nevertheless, as they gradually rise, and even extend to the neighbouring valleys, it appears reasonable to suppose that glaciers in general, instead of diminishing, on the contrary imperceptibly increase,—an opinion I have long encouraged, and which indeed seems to be forcibly strengthened by the number of passages in various parts of the Alps, formerly frequented, but now entirely filled with ice, as the one which originally led from Chamounie in Savoy, to Cormajeur in the Valley of Aosta, &c. But the question which remains to be determined, Whether glaciers increase in height, or extend in basis? is of too material consequence to geology to allow of any premature decision either in the negative or affirmative; for which reason, I shall at present defer hazarding my opinion on that subject, but reserve it for another work.

These accumulations appear to be in general formed of a whitish sand, containing mica, quartz, and feldspath; finally, decomposed granite, mixed with solid fragments of primitive rock.

In the one nearest to the icy vault from whence issues a part of the Rhône, I picked up a rare and curious piece of feldspath, not unlike mother-of-pearl, and, by its weight and structure, resembling the stone called by naturalists *Labrador*.

The current which flows from this vault (whose height is, at times, eighty feet, and length two hundred) mingles its waters with those of a small rivulet at two hundred and fifty yards distance, conceived with great reason, by monsieur de Saussure, to be the real source of the Rhône.

This transparent stream is formed by the junction of three springs, which flow from the basis of Mont Sasberg, at six hundred paces from the above vault, a mountain which forms a part of the Grimsel, before mentioned. The elevation of the valley, where the junction of these rivulets takes place, is accounted four thousand feet above the level of the sea, and two thousand four hundred and fourteen higher than the Lake of Geneva. It is certain that the general opinion entertained by many, that the source of the Rhône flows from beneath the glacier, arises in great measure from the idea, that

the foul current which issues from thence, being a much larger body than the rivulet itself, was naturally supposed to be, on that account, the source of so formidable a river. Be this, however, as it may, that opinion is at present pretty generally refuted by the inhabitants of the country; and besides, the difference that exists is so trifling, that I shall not further enlarge on the subject; but observe, that the water that issues from beneath this icy region raises Réaumur's thermometer two degrees and a half only above the freezing point; whereas the other, contiguous to the three clear and sparkling springs, raises it to fourteen.

Having so far completed my observations, and taken some refreshment in a wretched miserable cottage, of which there are two (Vide N° XXIV), close to the vault, in the bottom of the valley, I returned to Ober-gestelin, where, owing to my poor beast's having lamed itself during my morning's excursion, I was detained till the following day,—a circumstance which had like to have been unpleasant; for, it being Sunday, it was with the greatest difficulty I could procure either guide or mule to accompany me, the Vallaisans being, as before noticed, extremely strict and religious. Having however staid till public service was over, seconded by the influence of the *curé* (an influence not to be despised in any country, much less in one where it exerts itself with so much power), I soon obtained both, and continued, for the space of two or three English miles, the same road I had pursued the preceding evening; then, crossing the Rhône on a stone bridge, supported on two rocky peaks, the road begins to be at once steep, stony, and contracted, following at times a narrow valley, and at others the abrupt sides of a chain of lofty mountains, mostly composed of different species of schistus, very like horn-stone, as also of a kind of lamellated rock, which, by the structure and quantity of feldspath, hornblende, and quartz, contained in it, does not in the least differ from the spiry needles on the Great St. Bernard, its component parts having apparently the whole of the principles which compose the generality of those peaks. But here the road changes rather suddenly, and takes an eastern direction; whereas, hitherto, it had tended from north to south. The rocks, likewise, exhibit different forms and structure; for those which sheltered the contracted valley I was then climbing, instead of walking, were at first of a bluish schistus, and brittle, with wide and irregular strata, to which succeeded, for the space of nearly two miles, a kind of red slate, striated with quartz; in fine, after three hours' great labour, ascending rapidly the whole way, we reached a small plain, on which a few sheep were grazing round a

miserable-looking chalet, whose honest and rustic inhabitants received us with hospitality, and insisted on our partaking of their humble fare. From hence the prospect is again superb, commanding an extensive glacier, which absolutely appeared as if suspended between two spiry needles of granite, the Gries and Blint-horne, at the same time hanging over a valley of immense depth, forming a kind of lengthened vault or cave, covered by a large cornice of ice, under which flows a rapid torrent, foaming as it dashed from rock to rock, presenting to the eye a beautiful cascade, whose water, as is generally the case, from the extreme height which it precipitated itself, was reduced to vapour before it gained the bottom; but with this difference, that the spray was here forced back again, as it were, and absolutely hovered like a cloud above the glacier itself—a phenomenon that afforded me much satisfaction, as it not only amused me by the variety of forms which the water, thus reduced, offered to my view, but wonderfully strengthened my ideas as to the general formation of clouds.

At about two miles from hence we began to ascend another mountain, which may be considered as a continuation of the first, and this by a road both steep and stony, in a continual zig-zag, along the sides of the same lofty height, whose summit could not be discerned, being concealed in a thick wet cloud, which soon reached us; so that this laborious undertaking was not effected till after four hours' un-interrupted ascent, when we at last gained the top, which forms an irregular plain of one mile in width.

The fogs and mists, in which we had been involved, having descended into the adjacent valleys we had not long since quitted, I could easily perceive (the atmosphere with us being then perfectly clear), that the plain on which we stood was on all sides nearly skirted by a number of pyramids of granite and micaceous and argillaceous rock, at the bases of which lay such considerable quantities of fragments of the same rocks, that the plain, still covered with snow, though in the middle of July, was absolutely strewn with them. Among the pieces that pierced through the snow, I could discern many of a blackish schist, with thin laminæ, which effervesced with acids,—a circumstance which, though it seemed to prove that they contained calcareous matter, yet became singular, when I considered, that the summit of this mountain, on which passes the boundary of the Vallais, is eight thousand nine hundred and twenty feet above the level of the sea. I nevertheless experienced so great a degree of heat, and my eyes were so incommoded by the reflexion and glare of the sun against the snow, not having taken the necessary precaution of furnishing myself with a crape to throw over my face,

that it was with the greatest difficulty I could continue my journey; and indeed, for a length of time, had cause to repent my omission;—a caution necessary to be remembered by those who may hereafter be tempted to take a similar route.

As from the visible disorder and confusion which reigned in the arrangement and species of stone with which this plain was covered, it would be impossible to enumerate them, I shall merely annex the names of those that appeared most deserving the lithologist's attention, beginning first with a brownish schistus, sandy, effervescing with acids, and containing between its strata (which are in general thin) a species of mica of a bright grey tinge: secondly, a red schistus, containing much white mica: thirdly, another species of similar schistus, but more shihy and soft, resembling the true molybdate, or black mica, which becomes curious from being striated: fourthly, a kind of greenish schorl; another of violet, of rhomboidal form, containing particles of magnesia, as also some silex and argil: in fine, a species of red granite, of great coherency, in which were hornblende and quartz.

In descending the north-eastern side of the same mountain, similar confusion seemed to prevail in both the blocks and huge pieces of rock which on all sides surround it. Plants were scarce; and the first that I perceived were merely a few tufts of *carnillet moussier*, or *silene acaulis*, to which succeeded the *gentiana acaulis*, whose charming tint of azure blue most agreeably contrasted with the whiteness of the snow, which was not entirely melted. I then gradually met with the *Achillea genipi*, the *saxifraga bryoides*, and a number of *embrunes*, or *vaccinium*, of the three species; viz. *vitis Idea*, *uliginosum*, and *myrtillus*; the last of which I ate much of, and found extremely refreshing. But what is singular, I have not been able to meet with any of the same kind in England, though I am told that it grows on the mountains of Scotland.

After another hour's descent, we at last reached a small dale, the surface of which, though very irregular, is covered with excellent pastures. This kind of basin, whose form is nearly circular, appears so much the more extraordinary, that it resembles the extremity of a funnel, being surrounded by spiry needles of immense height, and its surface nearly filled with their fragments, of which many of the enormous masses are half buried under the soil, and then covered by a crust of vegetable earth five inches thick. From this appearance, therefore, am I naturally led to conclude, that this small plain owes its present elevation to pieces or blocks detached from the surrounding

mountains, by the effect of internal commotions, which have at various epochs affected most parts of the Alps.

From hence we continued descending for at least three-quarters of an hour, and gained, to our great satisfaction, the plain where stands the *hospice*, or hospital, (more deservedly termed asylum for the relief of travelers,) into which we were kindly received.

But, making a short stay, we proceeded three miles farther; and then, ascending for a quarter of a mile, reached Fontana, one of the first villages in the Valley of Livenen, now belonging to the canton of Uri, which sends hither, every four years, a bailiff, charged with the sovereign jurisdiction of the country, both civil and criminal.

The inhabitants of this valley, who may be deemed the descendants of the ancient or original Lepontians or Lepontii, have for a long time been hardly dealt with by their sovereigns, and often have they tried to shake off the yoke of servitude,—but in vain. The canton of Uri, aided by the other Swiss cantons, entirely subdued them in 1755, disarmed and deprived them of their ancient privileges, which had been conferred by Sforza, duke of Milan, whose subjects they were till 1441. At no considerable distance from Fontana, I found myself on the banks of the Tesino, a river whose waters flow impetuously in a deep channel, and from hence only could I date what may properly be deemed the ascent of St. Gothard; for, had I been desirous of going to Italy, I must have turned off nearly contiguous to the *hospice*, and taken the road to Bellinzona; a pretty little town near the Lake of Locarno, or Maggiore, and then to the Borromée Islands and Milan; but, as my plan was to make the tour of St. Gothard, and then return to Munster from hence, I took a northern direction, and arrived, after six miles laborious ascent, (though the road is in some places tolerably wide and good,) at Airolo, one of the largest towns in the Valley of Livenen, or *Vallis Lepontina*, which is populous, rich, and commercial, though six thousand two hundred and twenty feet above the level of the sea. The circumstance of its being commercial must in great measure be attributed to its situation, standing as it does on one of the most frequented passes of the Alps, and in fact the chief road from Italy to Germany, as the exports and imports across this mountain fully demonstrate, there not being less than twelve hundred mules or horses employed to and fro the whole year.

Being fatigued with my day's journey, I lay at Airolo, where there is an excellent inn, and amused myself, in the evening, with examining the mountains most contiguous to the town, which in general appeared of micaceous quartz, containing, in many





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places, particles of feldspath and schorl,—a species of rock conspicuous only in the vicinity of Airolo; for, prior to these, I had remarked that they were mostly of effervescent schistus; and, in the neighbourhood of Fontana, lofty calcareous mountains, in which no fossils were imbedded.

On leaving the town of Airolo, which is seated at the junction of several valleys watered by rivers that form the Tesino, we began to ascend that part of St. Gothard called by the people of the country *The last Step of the Mountain*. And here the road, in many places resembling a broken stair-case, follows the windings of the precipice, at the bottom of which runs the Tesino, which, owing to the abrupt state of the mountain on the side of Italy, forms a continuation of beautiful falls, of which the drawing N^o XXV. gives a faint idea, it being extremely difficult to do justice to such views,—the objects in that part of the Alps being, as before noticed, of too great magnitude to give an exact resemblance of them. I have however endeavoured to be as correct as possible in my representations, and have done my best to copy the stupendous masses of rock, with the form and direction of their strata, particularly attending to those which border the main road, which appear to be partly composed of micaceous schistus, striated with quartz and a kind of indurated serpentine of a greenish tinge, and partly of a species of compound rock of a deep green, spotted with black quartz and white dots, apparently of schorl, containing silex that strikes fire with steel.

Besides this variety of rock, the valley is likewise, in many parts, covered with huge blocks of red granite; and, about two miles from Airolo, these same rocks may be said to lose themselves under wide strata of a whitish stone, whose thin and undulated laminæ contain a quantity of red mica and pieces of schorl of great hardness, as also garnets of about five or six lines diameter, of a dodecagon, or twelve-sided figure, with a faded tinge of red, nearly opaque, but so extremely indurated, that neither time nor water, which have both visibly worn the siliceous paste in which these garnets are, as it were, buried, have in the least impaired or changed the form of the crystals, which still appear like brown salient spots.

Four miles hence I passed by a mountain of a hard kind of sand-stone, in which I found pieces of black and white quartz, red mica, and crystals of schorl of five lines in length. At the basis of this perpendicular mountain stands a small chapel, covered with *ex-votos*, dedicated to St. Anna, which, in a place naturally so wild and elevated, wonderfully increased the rude and romantic state of this part of the road, and rendered

it, with the assistance of a singular circumstance, a spot not to be forgotten: for, just as I was passing, the sound of voices struck my ear, when, looking round, I soon perceived four muleteers, stout well-looking men, devoutly kneeling close to the chapel, apparently in fervent prayer, whilst a fifth, at some little distance, diverted me not a little. He, poor creature, as devout as his companions, was reciting his rosary in a low and solemn accent; but so impressed with zeal and energy, that he did not see me, though addressing the Holy Virgin in so ridiculous a manner that I could scarcely contain myself. Each strophe or stanza was accompanied with bitter imprecations against his poor mules, who he was desirous should proceed on their journey, that no time might be lost; but, as they did not exactly seem to coincide with him in opinion, he, vastly enraged, while comparing the Virgin, in his pious ejaculations, to an ivory vase, or a silver tower, and expressing himself, as he intended, '*Spirituale*,' or '*Turris eburnea, ora pro nobis!*' &c. spared neither F....s nor B....s, as occasion required.

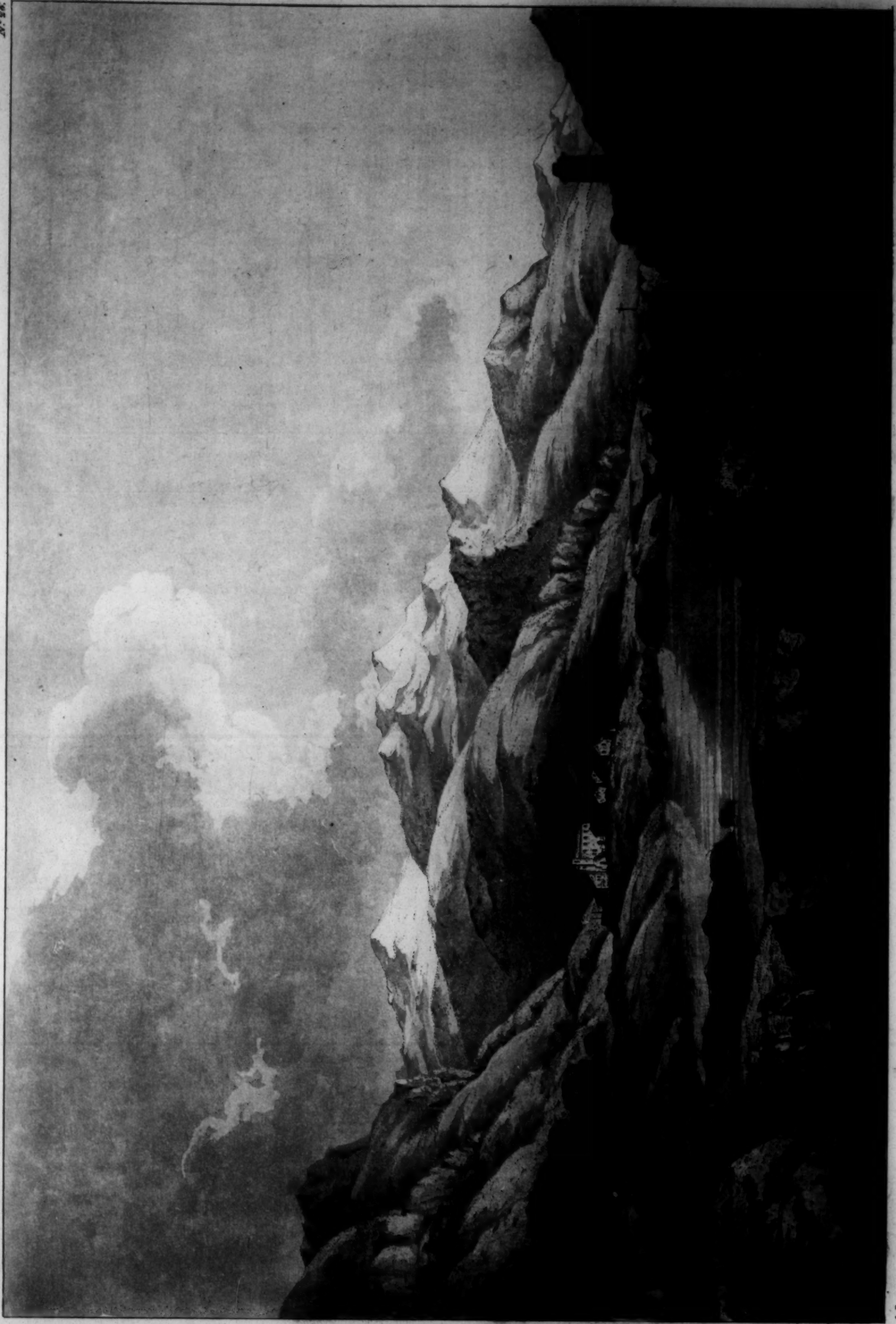
Being unwilling to shock this poor fellow, though the scene was truly novel and ridiculous, I disturbed him not, but pitied his ignorance, and journeyed on.

Not far from thence the surrounding country exhibits nothing but sterility and desolation,—neither tree nor shrub to be seen; the atmosphere so rare, that the rhododendron was the only bush I could perceive, and this but for a short time, having got beyond the zone favourable for the vegetation of ligneous plants, though not more than two thirds of the pass.

Still continuing to ascend, we soon began to perceive some scattered peaks of granite, covered, in many places, with micaceous schist; but not till after ten long miles laborious and fatiguing ascent from the town of Airolo, did we gain the summit of the mountain. In my way I collected a number of curious stones, among which, contiguous to the *hospice*, I found some garnets, similar to those already described, as well as a small quantity of green and blue schorl, not unlike, as to coherency and variety of colour, to the *sappare* of Bamffshire, in the north of Scotland. I also remarked some different-coloured feldspath, among which were a few of pearl-colour, or *gorge de pigeon*, that were beautiful, and of lamellated structure; likewise black schorl, mica of various tints, and crystals composed of black and white quartz,—the former of which is common on Mont Tremola, a mountain contiguous to the high road.

Having walked for the space of three or four miles, on the plain which forms the summit of the pass, where there are several small lakes, we reached the *hospice*, as





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before noticed, which is occupied by two Italian capuchins only, and a certain number of domestics, who indiscriminately receive every traveler gratis, and treat them with the greatest hospitality, though not with so much comfort as on the Great St. Bernard; yet are beds, and every article of the first necessity, easily obtained.

There are likewise chapels placed in different parts of the mountain, close to the road, provided, during the winter months, with bread, cheese, and wine, as in those previously described. About a mile from the *hospice*, which may be said to be seated in a swamp, considering the number of lakes that are contiguous to it, is the Luzendro, the most considerable of them (*Vide* drawing N° XXVI.), being from three to four miles long, and two wide; but in which, from the circumstance of its being frozen ten months out of the twelve, no fish can be preserved alive, though many attempts have hitherto been made to succeed.

This lake, which communicates with the others, forms the source of the Rheuss, a river that flows towards the north, and then throws itself into the Lake of the *Quatres Cantons*, as also that of the Tesino, which takes a southern direction, and mingles its waters with those of the Lake Maggiore.

The stupendous height of this passage, supposed by Cassini to be twelve hundred and eighty-two toises above the level of the sea, and eleven hundred and twenty ditto, or seven thousand one hundred and sixty-two feet only, according to my own barometrical measurements, varies, in the following respects, from that of the Great St. Bernard,—the latter being more elevated, having a smaller *plateau* or flat surface on its summit, and containing no granite whatever; whereas the St. Gothard may be considered as huge rocks of granite, heaped one on another, which by their junction form an extensive irregular plain, which seems to derive its present existence from fragments belonging to the surrounding spiry needles. Its longitude east is $9^{\circ} 2'$, and latitude $46^{\circ} 28'$.

These spiry tops, which appear as if ready to dispute the elevation of the rest of the chains that compose this part of the Alps, have each a particular appellation, though the one supposed to be the true St. Gothard is not yet ascertained.

Their bases are totally covered by their own fragments, and blocks of rock are even found that contain curious particles of green mica and feldspath. Those blocks are so considerable and numerous, that the road is absolutely forced round them, and consequently rendered rugged and irregular.

These peaks are likewise not all of granite, but in part composed of lamellated argillaceous rock, containing grains of quartz and feldspath, and, in part, of lamellated quartzose rock.

It is however those of granite only that contain rich mines of rock-crystal, of which there are some so abundant, as to yield several thousand quintals annually. Indeed many of the neighbouring peasants subsist entirely by the produce reaped in procuring them, which is a most dangerous enterprise, pursued at the risque of their lives. Some of these caves, or more properly ovens, from whence the crystals are picked, have been shown me, whose interior was covered with micaceous earth of a greenish tinge, and small crystals of mica and feldspath. At the village of Urseren I have also seen some beautiful black crystals, which sometimes contain particles of red fluspar.

The passage of St. Gothard is probably the only mountain in Europe that is formed by the junction of such a number of long chains of spiry peaks, piled one above another, as already observed, to such an astonishing height, or that gives birth to so many rivers and torrents as this does. For, if we begin on the south, we shall there find the Tesino, which takes its source on the summit of the mountain, and then empties itself into the Lake Majore and the Pô. Eastward are the three sources of the Rhine, which by their junction contiguous to the town of Richenau, five-and-forty miles from their source, form that beautiful river, which, after traversing a part of Switzerland, Germany, and Holland, throws itself, near Leyden, into the German Ocean. Northward flows the Rheuss, which, as before stated, takes its source in the Lake Luzendro; then, passing through the Lake of Lucerne, or Four Cantons, mingles with the Aar near the town of Vindisch, fifteen miles before this last river reaches the Rhine: whilst, north-west, runs the same river, which traverses the lakes of Brieng and Thun; and, westward, the Rhône, the course of which I have described from its source to where it throws itself into the Mediterranean Sea.

Having now given a pretty accurate description of this stupendous passage, particularly attending that part which appears best calculated to satisfy the traveler's curiosity, I shall resume my narrative from the *hospice*, or hospital, which I have already said is not to be compared, in neatness or internal regulations, to the one on the Great St. Bernard; this institution not having the same means to maintain itself with similar profusion, though still a most fortunate and comfortable asylum. Here I staid about three hours, during which I visited every part of the building and its environs;

after this, being desirous of seeing the *Pont du Diable*, or Devil's bridge, my guide and I crossed the Rheuss, and proceeded to Urseren, a town five or six miles from the summit of the pass.

The road, on first setting out, began to descend rapidly; but having passed through the small village of L'Hôpital, situated in the valley of Urseren, it became less so. The town, which takes the name of the valley, where we slept, is accounted its metropolis; and the inhabitants, who enjoy great privileges, are to be considered as protected, rather than governed, by the canton of Uri.

They are judged by their own laws, and they elect their own magistrates; the chief of which, who is named by the people assembled in a body in the open air, near the above-mentioned village, the second Sunday in May, every two years, takes the title of *Amman*, or *Thal Amman*, Governor of the Valley, and presides at a council composed of individuals also chosen by the people.

The inhabitants of this singular little valley, whose extent does not exceed ten miles in length and five in width, and so elevated that trees cannot exist, are nevertheless opulent, well informed, and carry on a considerable traffic in cattle and cheese.

The day after I visited the *Pont du Diable*, or *Teuffels-Bruck*, three miles and a half distant from Urseren, where the road, which is also the one which leads to Switzerland, is rugged and steep; but, at no great distance from the above town, it is cut through a hard rock, forming a vault of about eighty yards long, twelve wide, and ten in height. This passage or gallery, effected at great expense and labour, through a hard quartzose rock, is called by the people of the country *Urner-lock*, or *Tron du Pays d'Urner*, or *Urseren*.

The rocks are here so abrupt, and the valley so contracted, that, before this opening was made, the numbers of people that perished by the *avalanches* was dreadful; for the falls of snow are so frequent and tremendous in the spring, that there have been instances of the valley being entirely filled up with it; so that the following lines of Claudian, who lived in the fourth century, alluding to the army commanded by the general Stilico, passing across the Rhætian Alps, may be deemed equally applicable to this high contracted pass.

Sed latus, Hesperiae quo Rhætia jungitur oræ,
Præruptis ferit astra jugis, pandit-que terendam
Vix æstate viam. Multi ceu Gorgone visa

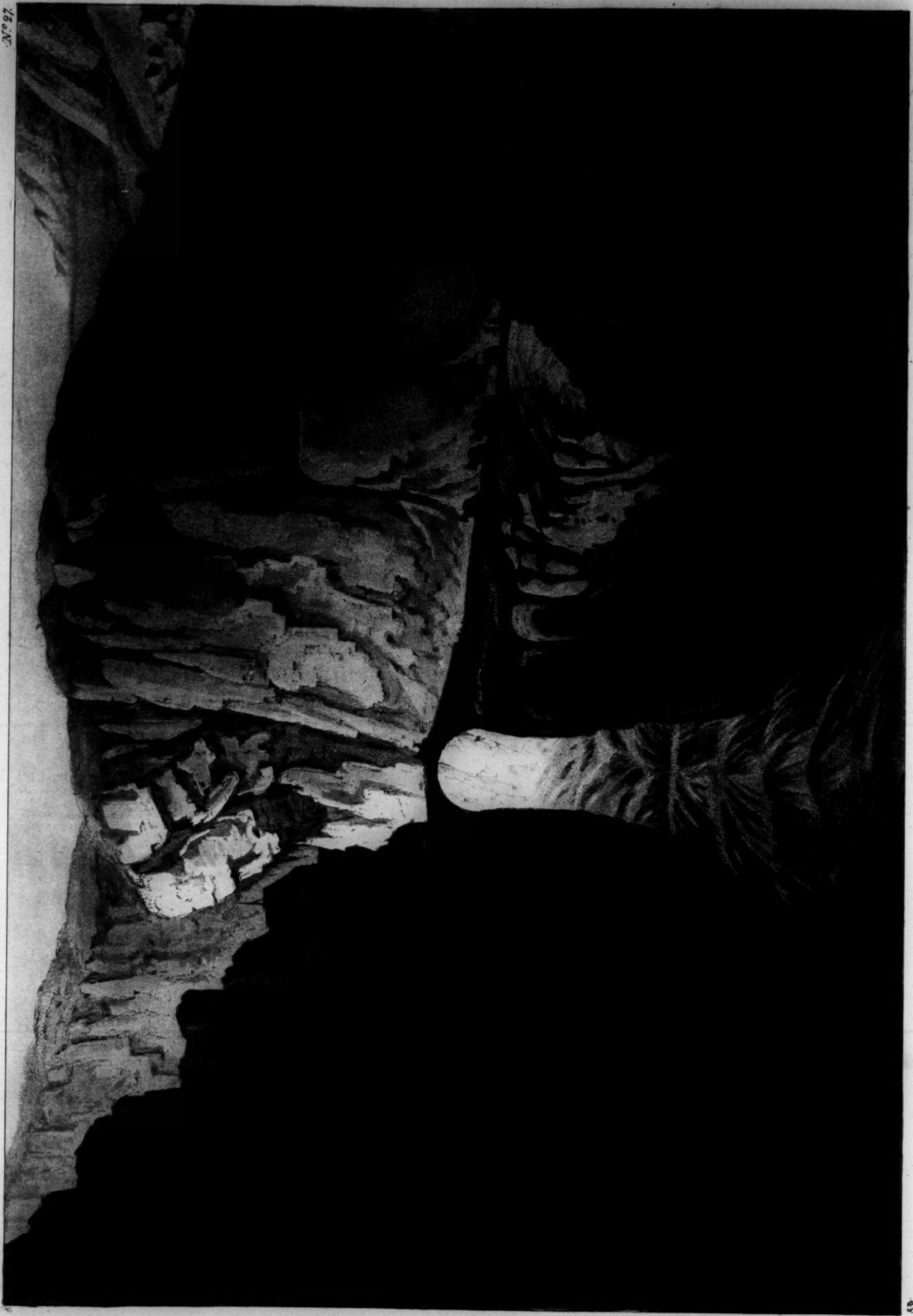
Obtigue gelu. Multos hausere profunda
 Vasta mole nives, cum-que ipsis sæpe juvenis
 Naufraga candenti merguntur plastra barathro.
 Interdum glacie subitam labente ruinam
 Mons dedit, et tepidis fundamina subruit astris,
 Pendenti malefida solo. Per talia tendit
 Frigoribus mediis Stilico loca.

The greatest curiosity in the Devil's Bridge consists in the boldness of the execution, being built of one single arch, a plain centre or semi-circle, of about two-and-twenty feet radius, supported on two stupendous rocky peaks, nearly perpendicular, between which flow, at the depth of some hundred feet, the foaming waters of the Rheuss, whose rapid stream, and the extreme impetuosity of so great a body of water, confined in so narrow a rocky channel, added to the vast height of the different falls, oftentimes occasion, by the vapour of the water, a constant series of rainbows, the effect of which is truly beautiful. I have not omitted, in drawing N° XXVII. which represents the bridge, to add the quartzose rocks which skirt the valley of Schollenan, whose strata are nearly vertical.

After having carefully examined the chain of mountains that descend along the Rheuss, in the cantons of Uri, we returned to Urseren, where I was detained a few days, in order to participate in the hilarity of a festival. It was one instituted in commemoration of the return of a youth, the son of a respectable man, an innkeeper*, at whose house I had taken up my residence, who (singular as it may appear, although it is frequently the case in Switzerland), desirous of seeing the world, had enlisted in one of their regiments, at that time in the service of France, and who, having completed his three years (the allotted period), was daily expected to be restored to the arms of his father and family, by whom he was adored. And so amiable was this young man, that his youthful associates and friends, rejoicing at the idea of seeing him again, had assembled, with drums beating and the banners of their department flying, to proceed as far as Urner-lock, in order to welcome his return and make his entry truly triumphant.

One thing, however, must be noticed, that this young soldier's friends were much respected, and that his father, though what in England would be styled an innkeeper, having held the office of *Thal Amman*, or chief magistrate, with great honour and pro-

* Properly speaking, there are no regular inns, but literally private houses, where the traveler may think himself fortunate in being admitted; and where, in general, excellent accommodations are met with.



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bity, the inhabitants, desirous of paying him a compliment, and showing particular attention and attachment to his family, had countenanced this jubilee, which, of course, naturally created others; so that, for a week or ten days, Urseren was nothing but mirth and jollity:

Being, however, anxious to proceed, I took my leave the third day after my arrival, perfectly satisfied with their entertainments, and charmed at the manner in which an uninterrupted succession of rustic amusements were continually introduced to vary the scene and delight the guests. It is certain, that as the taste and amusements of the inhabitants of this part of Upper Switzerland are in general both simple and innocent, they are consequently easier gratified. But though they display much gaiety and vivacity, the natural result of that portion of rational liberty which they enjoy, yet are they more sedate than the Italians, bearing in their countenance and deportment that dignity which cannot fail to characterise men who feel their independence, and fear not to lose it, by never attempting to multiply their wants and desires to a vicious excess; so that we may truly add the lines of the poet:

Here too dwells simple truth; plain innocence;
Unsully'd beauty; sound unbroken youth,
Patient of labour, with a little pleased;
Health ever blooming; unambitious toil.

Knowing that the remainder of my excursion would be fatiguing, though the space I had to go over was of no great extent, being no more than about five-and-twenty miles, I set off betimes, and, passing through the village of L'Hôpital, proceeded across Zundorf and Realp, when, taking a south-western direction, I found myself on the side of the Furca; then, keeping along its glacier for about three English miles, by the most frightful and terrific road that can possibly be imagined, exhibiting a continual chaos, nature all around me being *rudis indigestaque moles*; while my sensations were alternately assailed by the freezing cold of Siberia, and the intense and suffocating heat of the torrid zone, for the space of fourteen hours incessant walking, till we gained Obergestlin, which I reached absolutely exhausted, and under the necessity of stopping one whole day to recruit my strength, and arrange my collection of lithology.

These objects being obtained, I determined on returning to Sécheron, the village from whence I set out, contiguous to Geneva, having been absent rather better than a month, during which I may with truth assert, that, in spite of danger and fatigue, which

could not possibly be avoided, I felt continual satisfaction and amusement, and the information and experience which I gained I deemed a rich remuneration for my trouble. I hope also that the reader, who has followed me through this little ramble, has not thought the time wasted which he has devoted to it. My object in the detail has been rather instruction, than that amusement of the lighter kind, commonly derived from books of travels.

Nature has been more my study than men; and I have rather endeavoured to trace the tremendous revolutions of the universe, and to mark their effects, than to enlarge on those things which so frequently take place in civil society. I have not, however, forgotten my species; their history, as far as it came in my way, I have concisely given, and have with pleasure portrayed the happiness of simple and uncorrupted society,—a happiness which, though it does not strike in description, and charm men of dissipated manners, is congenial with our nature, and to the pursuit of which the philosophic philanthropist ardently wishes to awaken mankind.

FINIS.

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LOMBARDY, &c.

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LYONS.

This view is taken from the arsenal, beyond St. Jean's bridge. The cathedral that bears its name, of which only two towers and a part of the front are discernible, stands near the same spot; whilst on the summit of the mountain, in the back-ground, is represented the church of De Fourvière, and the villages of St. Just and St. Foy on the most distant hills.

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REPRESENTATION OF THE ABOVE LAKE.

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PLATE VIII. (*next to p. 40.*)

LOSS OF THE RHONE.

Village of Coussy on the right, château and village of Bellegarde on the most elevated part of the same hill. The bridge is that of Coussy, which formerly served as a limit to France and Savoy. The ladder, as mentioned in the description of the Rhône, is placed for the convenience of strangers who are desirous of minutely exploring the channel and disappearance of the river.

PLATE IX. (*next to p. 40.*)

RE-APPEARANCE OF THE RHONE.

A view of the same bridge as plate VIII. but seen on the opposite side. Corn and saw mills on the left, worked by the Valsorene, a torrent which throws itself into the Rhône. The most distant mountains, Savoy.

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The rocks on the right are the Vouaches, at the bases of which flows the Rhône with great impetuosity: the back-ground, a continuation of Savoy. The abrupt rocks at the back of the foot extend to the margin of the drawing, form the head of the Jura, while the small village of Longarettes stands at the foot of the mountain.

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FIG. I.

INTERNAL VIEW OF THE ROMAN THEATRE AT LYONS,

The ruins of which are extant in the heretofore convent of Minimes.

FIG. II.

VOLTAIRE'S TOMB,

Erected by his orders, and placed, during his life, in a yard at the back of the chancel.

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GENEVA.

The hill and forest of Labatie are represented on the right. At the basis of this hill runs the polluted Arve, a river that mingles its muddy waters with the Rhône at the foot of St. Jean; another mountain on the left, as described in the article of Geneva. The lake is distinguishable near the back of the city. The Voirons form the back-ground; and the two Salèves, whose feet are literally hid by the hills of Cologny, are the most conspicuous.

PLATE XIV. (next to p. 79.)

VERSOIX.

A village on the Lake of Geneva. The small dots discernible in the water, close to the isolated habitation, built, as it were, in the lake, indicate the remains of the harbour, began five-and-twenty years ago by order of Lewis XV. of France, as explained in the description of the above village. The château in the back-ground, with the four square towers, is Copet, belonging to M. Neckar; and the most distant mountains, a continuation of the Jura.

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PLATE XVII. (next to p. 101.)

VEVAY.

The pleasantest town in Switzerland. This view was taken from the north end of the town, nearly contiguous to the road that leads to the canton of Freyburg. The stupendous rocks in the back-ground, on the right of the drawing, are partly in Savoy and partly in the Vallaisan country. At no considerable distance from the small tower which rears its head on the same side, close to the edge of the lake, stand the famous rocks of Meillerie; while the mountains on the left form the basis of what is called La Dent de Gament; and a part of the Great St. Bernard, crowned with eternal snow, terminates the horizon.

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SALT-WORKS AT BEX, CANTON OF BERNE.

The long, narrow buildings, which have the form of galleries, erected on the hills that skirt the river on which the bridge is constructed, are those of gradation; whereas the houses in the bottom are used for the ebullition of the brine, refinement of the salt, magazines, &c. as mentioned in the article of Bex. The mountains at the back of the former buildings are mostly of gypsum, and contain the saline springs.

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BRIDGE OF ST. MAURICE ON THE RHONE.

The small square tower, on the bridge determines the limit between the states of Berne and those of the Vallais. The distant mountains, covered with snow, exhibit a part of the Mont Velan and Great St. Bernard.

PLATE XX. (*next to p. 140.*)

MARTIGNI AND THE VALLEY OF THE RHONE.

The ruins extant, on the rock which commands the town, are the remains of the ancient residence of the bishops of Sion, who, in the fourth century, styled themselves of Octodurus. The Rhône flows in the bottom of the valley previous to its reaching the bridge of St. Maurice. The opening discernible between the two elevated mountains, seated at the back of Martigni, is the valley that leads to the glacier of Triant, and the chaumière on the right, the chalêts near which the present view was taken.

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This drawing represents the small valley situated at the basis of a part of the extensive glacier La Valpeline, contiguous to that of La Valsorey. The chalet on the left is the one described by the author, when he speaks of the Great St. Bernard, into which he was received with so much hospitality, when taken by the pilgrim, after the tremendous storm he had to encounter on that passage.

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OR CONVENT.

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PLATE XXIII. (*next to p. 172.*)

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PLATE XXIV. (*next to p. 200.*)

SOURCE OF THE RHONE AND GLACIER OF LA FURCA.

The three transparent sources rise at the back of the hill, at the basis of which stand the small chalêts or huts, as represented in the drawing, the author having taken the view from the top of a small *plateau*, or flat surface, which commands the extensive glacier of La Furca, and Icy Vault, from whence issues a part of the Rhône, as described. On the right stands the mountain which bears its name, and on the left the basis of the Grimsel.

PLATE XXV. (*next to p. 207.*)

ASCENT OF THE ST. GOTHARD.

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PLATE XXVI. (*next to p. 209.*)

HOSPICE ON THE ST. GOTHARD.

Representation of the plain on the summit of this pass, with the Lake Luzendro, from whence the rivers Rheuss and Tesino take their source. The small building on the left gives an idea of the chapels, in which provisions are deposited for the traveler during tempestuous weather; and the stakes seen in various parts of the mountain trace the road, or path, when the whole surface is covered with snow, which is sometimes at the immense depth of four-and-twenty feet.

PLATE XXVII. (*next to p. 212.*)

THE DEVIL'S BRIDGE.

This view gives an idea of the above passage, on the side of Switzerland, and very accurately exhibits the strata of those mountains which skirt the valley, at the bottom of which impetuously flow the waters of the Rheuss.

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